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AGRICULTURAL LAND DRAINAGE IN ONTARIO

FINAL REPORT OF THE SELECT COMMITTEE ON LAND DRAINAGE

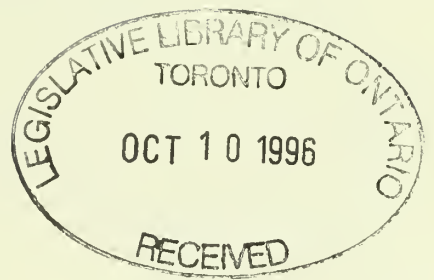
LORNE C. HENDERSON, M.P.P.
CHAIRMAN

JUNE 1974





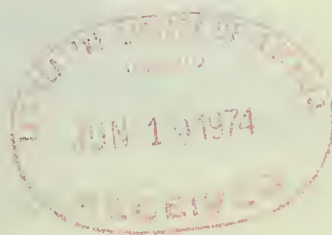
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Agricultural Land Drainage In Ontario

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Tabled 18 June 1974
4th Session
29th Parliament



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Ted Whipp*



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FINAL REPORT OF THE SELECT COMMITTEE ON LAND DRAINAGE

TABLED IN THE LEGISLATIVE ASSEMBLY
BY
LORNE C. HENDERSON, M.P.P.
CHAIRMAN

June 1974
4th Session, 29th Legislature, 23 Elizabeth II

TABLE OF CONTENTS

CHAIRMAN'S MESSAGE	Page VI
LETTER OF TRANSMITTAL	VII
COMMITTEE MEMBERS AND STAFF	VIII
TERMS OF REFERENCE	X
THE WORK OF THE COMMITTEE	XI
SUMMARY OF RECOMMENDATIONS	XII
I. AGRICULTURAL LAND DRAINAGE — OBJECTIVES AND BENEFITS	1
II. THE LAW OF DRAINAGE — PAST AND PRESENT	3
The Common Law	3
The Statute Law	3
Other Legislation Affecting Land Drainage in Ontario	6
III. THE EXTENT OF LAND DRAINAGE IN ONTARIO, 1964-72	8
A.R.D.A. Drainage Assistance	8
Special Agricultural Drainage Assistance	8
Capital Grants for Farm Development	8
Drainage Act Expenditures by Township, 1964-72	10
Annual Tile Drainage Expenditures, 1962-72	11
Tile Drainage Act Expenditures by Township, 1964-72	11
Regional Overview of Drainage Activity, 1964-72	12
IV. THE ENVIRONMENTAL IMPACT OF DRAINAGE WORKS	14
Summary	17
V. LAND-USE CONFLICTS RESULTING FROM DRAIN CONSTRUCTION	18
Benefit-Cost Analysis Prior to Drain construction	22
Land-Use Planning	22
Formulation of Land-Use Priorities	23
VI. COSTS AND AGRICULTURAL BENEFITS	24
VII. AN EXAMINATION OF DRAINAGE COSTS	29
VIII. THE PETITION PROCEDURE	37
Proposed Procedures	38
An Alternative Procedure	38
An Environmental Impact Statement	39
Benefit-Cost Considerations	39
Preliminary Engineering and Report	40
IX. THE ENGINEER	41
The Present Function of the Engineer	41
Difficulties with the Present System	41
Proposals	42
Suggestions for Improved Procedures by the Engineer	43
X. THE DRAINAGE SUPERINTENDENT	45
Duties of the Superintendent	45
Qualifications and Training	45
Compensation	46
XI. MAINTENANCE, REPAIR AND IMPROVEMENT	47
XII. CONSTRUCTION PRACTICES	49

XIII.	THE APPEAL PROCEDURE	52
	The Present System	52
	A New Appellate Procedure	53
	The Court of Revision	53
	Ontario Drainage Appeal Tribunal	53
	Divisional Court	55
	Time Limits	55
	Composition and Procedures of the Tribunal	55
XIV.	FINANCIAL ASSISTANCE	57
XV.	THE DRAINAGE ACT	59
	Problems	59
	Recommended Amendments	60
XVI.	THE TILE DRAINAGE ACT	66
XVII.	THE ROLE OF THE ONTARIO MINISTRY OF AGRICULTURE AND FOOD	68
XVIII.	SPECIAL PROBLEM AREAS	69
	Matters Under Federal Jurisdiction	69
	Euphrasia Municipal Drain No. 1	72
	Qualifications of Engineers and O.L.S.	74
	Great Lakes Water Levels	75
	Beaver in Drainage Ditches	75
	Lakeshore Erosion	75
	A Suggested Regional or County Drainage Commission	76
	Barriers to Agricultural Land Drainage	76
	River Flooding	77
XIX.	WATER MANAGEMENT — A PLAN FOR THE FUTURE	79
	Florida	79
	Nebraska	79
	Manitoba	80
	The United Kingdom	81
	Summary	82
APPENDIX I	— Itinerary and Hearings of the Committee	83
APPENDIX II	— Oral and Written Submissions to the Committee	84
APPENDIX III	— Ontario and Federal Legislation Which May Affect Drainage and the Operation of the Drainage Act	97
APPENDIX IV	— Cases in Drainage Law	99

INDEX TO TABLES AND FIGURES

Table 1. Average Benefit-Cost Ratios in Sample Drains	26
Figure 1. Grant Expenditures	9
Figure 2. Drainage Cost Index	33
Figure 3. Farm Price Indicators	34
Figure 4. Economic Indicators	35

CHAIRMAN'S MESSAGE

This Committee, appointed in June 1972, made an interim report to the Legislature in December 1972. Herewith is the final report wherein we have made a number of recommendations which, if implemented, we hope will make a real contribution to agricultural development in Ontario.

I should like to extend particular thanks to the Honourable William G. Davis, Q.C., Premier of Ontario, and the Honourable William A. Stewart, Minister of Agriculture and Food, for their recognition of an important matter to the people of Ontario and for their foresight in arranging for the appointment of this Committee, which, we hope, will provide some workable solutions to the problems raised.

The Committee wishes to thank the many agricultural representatives and agricultural engineers of the Ministry of Agriculture and Food, who kindly made arrangements for most of the meetings of the Committee throughout the Province. We gratefully acknowledge the assistance of the Association of Professional Engineers, the Association of Ontario Land Surveyors, the many contractors throughout the Province who appeared and made submissions, and the municipal officials, both elected and appointed, who made their views known to the Committee. We are also grateful to those whom we consulted on technical matters in Ontario, and in other jurisdictions. We greatly appreciated the valuable contribution made by the members of the public who took the time to express their views to the Committee, both in writing and by appearing at public hearings.

I should like to express my personal thanks to all the members of the Committee, each of whom displayed a great dedication to the task at hand and a keen interest in the subject under investigation.

Finally, I express the thanks of the entire Committee to the Committee staff, including the Clerk of the Committee, the Research Director, the Consulting Engineer, Counsel to the Committee, and the secretarial and administrative staff. Without their enthusiastic and effective support, the completion of this task would have been much more difficult.

A handwritten signature in black ink, reading "Lorne C. Henderson". The signature is fluid and cursive, with the first name "Lorne" being more prominent and stylized than the last name "Henderson".

Lorne C. Henderson, M.P.P.
Chairman

MEMBERS

Fred A. Burr, M.P.P.
Robert G. Eaton, M.P.P.
Donald Wm. Ewen, M.P.P.
Rev. William Ferrier, M.P.P.
Maurice Hamilton, M.P.P.
Ronald K. McNeil, M.P.P.
Dr. W. J. Nuttall, M.P.P.
Donald A. Paterson, M.P.P.
John P. Spence, M.P.P.
Douglas J. Wiseman, M.P.P.



ONTARIO

LEGISLATIVE ASSEMBLY

SELECT COMMITTEE ON LAND DRAINAGE

Parliament Buildings
TORONTO, ONTARIO

CHAIRMAN

Lorne C. Henderson, M.P.P.

CLERK

David Callfas

June 1974

TO: The Honourable A. E. Reuter
Speaker of the Legislative Assembly of the Province of Ontario

Sir:

We, the undersigned members of the Committee appointed by the Legislative Assembly of the Province of Ontario on June 30, 1972, to enquire into and review the law relating to land drainage, have now the honour to submit the attached final report on land drainage.

Lorne C. Henderson
Lorne C. Henderson, Chairman

Fred A. Burr
Fred A. Burr

Robert G. Eaton
Robert G. Eaton

Donald Wm. Ewen
Donald William Ewen

William Ferrier
Reverend William Ferrier

Maurice Hamilton
Maurice Hamilton

Ronald K. McNeil
Ronald K. McNeil

Dr. William J. Nuttall
Dr. William J. Nuttall

Donald A. Paterson
Donald A. Paterson

John P. Spence
John P. Spence

Douglas J. Wiseman
Douglas J. Wiseman

COMMITTEE MEMBERS

L. C. Henderson, M.P.P., Lambton
Chairman

Fred A. Burr, M.P.P.
(Sandwich-Riverside)
Robert G. Eaton, M.P.P.
(Middlesex South)
Donald Wm. Ewen, M.P.P.
(Wentworth North)
Rev. William Ferrier, M.P.P.
(Cochrane-South)
Maurice Hamilton, M.P.P.
(Renfrew North)

Ronald K. McNeil, M.P.P.
(Elgin)
Dr. W. J. Nuttall, M.P.P.
(Frontenac-Addington)
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(Essex South)
John P. Spence, M.P.P.
(Kent)
Douglas J. Wiseman, M.P.P.
(Lanark)

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Secretaries:
Mrs. Doris Dunne
Miss Jane Maher
Mrs. Glenda Callfas

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Ronald Rowcliffe
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James A. Monteith, P.Eng.

Research Director:
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A. R. Hill

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Michael Mitchell
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Editorial Consultant:
L. A. Schwartz



Standing: Glenda Callfas, David Callfas, Douglas Gray,
(L to R) Donald Paterson, Fred Burr, Robert Eaton,
Donald Ewen, William Nuttall, William Ferrier,
Edward O'Meara, Douglas Wiseman, James Monteith

Seated: Jane Maher, Ronald McNeil, Lorne Henderson,
(L to R) Maurice Hamilton, Doris Dunne

Inset: John Spence

TERMS OF REFERENCE

By resolution of the Legislature of Ontario a select committee was appointed on June 30, 1972 to examine, study and inquire into the following matters regarding land drainage in Ontario:

- (1) The objectives of land drainage as an agricultural practice and the benefits to be derived from such practice.
- (2) The associated problems of competing land use in the urban fringe and in wetlands, as influenced by land drainage projects.
- (3) The problem of public interest in land use over the drainage of private lands by individuals.
- (4) The prior evaluation of the benefits and costs of a drainage project.
- (5) An evaluation of the petition procedure for initiating a drainage project.
- (6) A review of the construction, improvement and maintenance procedures under "The Drainage Act" in achieving the objectives.
- (7) A review of the appeal procedures under "The Drainage Act".
- (8) A review of the financial procedures and assistance under "The Drainage Act" and other drainage programs.
- (9) A study of the costs of land drainage and what influences such costs and how they may be reduced, i.e. engineering costs, etc.
- (10) An evaluation of construction practices in general and erosion and weed control of drainage ditches in detail.
- (11) A review of the administrative practices and methods in carrying out responsibility under "The Drainage Act".

And after due study and consideration, the Committee was directed to recommend such changes in the laws, procedures and processes as in the opinion of the Committee may be necessary and desirable.

THE WORK OF THE COMMITTEE

Upon its appointment on June 30, 1972, the Committee met in Toronto during July to plan and organize its method of procedure. At this time, the Committee appointed Mr. James Monteith, P. Eng., of the firm of Monteith-Ingram Engineering Ltd., Petrolia, Ontario, as engineering consultant. Mr. J. E. O'Meara, Associate Director of the Economics Branch of the Ministry of Agriculture and Food was assigned to act as Research Director. The Clerk of the House appointed Mr. David Callfas as clerk of the Committee. Mrs. Doris Dunne, Miss Jane Maher, and Mrs. Glenda Callfas acted as secretaries.

Mr. Ronald Rowcliffe of Sarnia acted as legal counsel during June 1973. Mr. Douglas K. Gray of Toronto was appointed legal counsel in 1974.

In August, the Committee advertised its terms of reference in the weekly and daily newspapers across the Province and invited written briefs and intentions to make oral representations. As a result the Committee received 590 briefs and letters from concerned individuals who wished to be heard. Lists of these briefs and representations are included in Appendix II.

The Committee began its travels and hearings on August 23, 1972 in the City of Kingston and since that time completed visits to 40 other locations in the Province and elsewhere to hear briefs and presentations and to make independent studies of problems and programs.

There was great interest in the rural areas on the question of land drainage as was evident from the number of briefs and presentations that were made to the Committee. All persons and organizations that wished to be heard were encouraged to come forward. The program usually consisted of a tour of the area in the morning, with hearings in the afternoon and evening. Municipal organizations and officials were heard in the afternoon, and the evening meetings were open to the general public.

Research Program

The Committee authorized three research programs as part of the study of agricultural land drainage in Ontario. The legal research was carried out by the Law School of the University of Toronto, under the direction of Professor A. T. Weinrib with the aid of two students, Michael Mitchell and James Blacklock. This research study included a review of the history of drainage law in Ontario, the preparation of a paper dealing with Ontario legislation which affects land drainage, and also a paper on federal statutes which affect land drainage in Ontario. A search was made for the written judgments of the Drainage Referee and summaries were made of these as well as those cases which had been heard by the Ontario Municipal Board.

The Committee awarded a study of benefits and costs and environmental impacts of drainage works to the Department of Geography at York University. This work was begun in January 1973 and completed on schedule on September 15, 1973. The study was under the direction of Professors W. C. Found, E. S. Spence, and A. R. Hill.

A study of engineering and construction costs was carried out by the firm of Todgham and Case Ltd., Engineering Consultants, Chatham, Ontario. Mr. H. H. Todgham, the senior partner in the firm, was responsible for the work.

Travel Program

The Committee's travels outside of Ontario included visits to Michigan, Nova Scotia, Newfoundland, Quebec, Florida, and Manitoba.

The trip to Michigan allowed the Committee members to view the latest drainage equipment in actual operation at a demonstration field day. The workings of the Drainage Commission were examined in Nova Scotia, and the Committee visited experimental plots in Newfoundland where bog areas were being drained for vegetable production.

In Quebec, the Committee had an opportunity to compare the policies and programs of a neighbouring jurisdiction and to evaluate the Ontario experience in light of the progress being made by the Quebec Department of Agriculture in providing drainage to Quebec farmers.

In Florida, the Committee was impressed with the recent legislation which gave control over water as a natural resource to one department of the state government. Similarly, the control of water and drainage in Manitoba is under the direction of a single department, and the Committee again noted with interest that this was a recent move and decision by the Province of Manitoba.

Essay Contest

During the course of its work, the Committee sponsored an essay competition among the students at the various agricultural colleges in Ontario. Nine essays were submitted on the subject "Agricultural Land Drainage — Benefits and Objectives." Cash prizes were won by Ron Sadler of the New-Liskeard College of Agricultural Technology, Chas. Bauman of the Centralia College of Agricultural Technology, and Robert M. Perras of the Kemptville College of Agricultural Technology.

The Committee appreciated the interest shown by the students and hopes that the contest encouraged their interest in the important subject of land drainage.

Interim Report

In December 1972, the Chairman tabled an Interim Report of the Committee in the Legislature of Ontario. Certain recommendations were made at that time and are summarized herewith.

1. It was recommended that A.R.D.A. assistance to drainage works in the eleven eastern counties of Ontario be continued until the end of the federal-provincial rural development agreement in March 31, 1975.

2. It was recommended that demonstration drainage plots be provided in northern Ontario to help farmers of that region become aware of the advantages of drainage.

3. It was recommended that the Ministry of Agriculture and Food make loans available for tile drainage to farmers in unorganized territories and districts at the same rate and on the same terms that farmers in other areas are able to borrow under The Tile Drainage Act.

4. The Committee recommended several changes in Section 4 of The Drainage Act which concerns the requisition type of drain:

(a) That the amount required as a deposit from the requisitioning farmer be raised from \$100 to \$200;

(b) That the amount which could be spent on any requisition drain be raised to \$7,500;

(c) That the geographical limit be deleted completely;

(d) That the engineer be required to report that, in his opinion, the drainage work proposed is not required or is impractical;

(e) That the Act be amended to permit the municipality to ask for reconsideration by the engineer and that the engineer be required to file this new report within 60 days; and

(f) That the Act be amended to make drainage works constructed under this section eligible for grants under Section 62.

SUMMARY OF RECOMMENDATIONS

AN EXAMINATION OF COSTS PART VII p.36

The Committee recommends:

1. that administrative costs related to drainage works (by-law preparation etc.) be considered part of the general administrative operation of the municipality and not be included in the direct charges assessed against a drainage works.

THE PETITION PROCEDURE PART VIII pp. 37-40

The Committee recommends:

1. that Section 3 (1) of The Drainage Act be redrafted so that a valid petition will consist of signatures representing a majority of the properties, (i.e. one signature per property to be benefited) or any number of properties representing 60 percent of the total acreage to be benefited;

2. that the phrase "area requiring drainage" in Section 3 (1) be replaced by "area to be benefited as determined by the engineer";
3. that subsection 4 of Section 3 be deleted;
4. that upon the presentation of a petition the municipal council must appoint an engineer whose duty it is to immediately confirm the validity or otherwise of the petition and define the drainage area;
5. that the Minister of Agriculture and Food may petition for the initiation of a drainage works;
6. that an environmental impact statement and a benefit/cost certificate be filed along with the engineer's report;
7. that a municipal council be permitted to require a preliminary engineering report prior to a final engineering report if in its opinion such a preliminary report is necessary for decision as to whether or not to accept the petition.
8. that the council of any local municipality be required to act on the request of one or more ratepayers to initiate preliminary studies — preliminary engineering, environmental and benefit/cost of any new proposed drainage works;
9. that the Ministry of Agriculture and Food subsidize the cost of these preliminary reports within the normal grant structure now available for construction of drainage works;
10. that the Minister of Natural Resources be permitted to appeal any new drainage proposal on environmental grounds and that the Minister of Agriculture and Food may appeal on the grounds that farmers' legitimate drainage requirements are being frustrated;
11. that the right of the road superintendent or the Minister of Transportation and Communications to initiate a drainage project be retained;

THE ENGINEER PART IX pp. 41-44

The Committee recommends:

1. that where the engineer appointed is a corporation, association or partnership such an appointee be required within 10 days of the date of appointment to notify the council of the name of the individual engineer or land surveyor who will have charge of the project;
2. that the first duty of the engineer in the case of a new drain should be to determine the area to be benefited in order to confirm the validity of the petition or to establish the requirements of such a petition where a petition has not been raised;
3. that the engineer be present at an on site meeting to hear any representations which interested parties wish to make;
4. that the engineer be required to place sufficient bench marks to permit reasonable control of elevation for future repairs or improvements;
5. that the whole of Section 8 of The Drainage Act which deals with the engineer's report be redrafted;
6. that Subsection 2 of Section 8 be amended to provide that costs of modification to a drain occasioned by a change in land use from agriculture be made at the expense of the drainage works and not charged to the road authority;
7. that Subsection 3 of Section 8 be deleted;
8. that the subjects dealt with in Subsection 4 and 5 be amalgamated into one subsection so that access bridges, farm bridges and water gates should be built and maintained by the drainage area;
9. that the engineer be permitted to grant allowances for damages to ornamental trees and fences which cannot be strictly included in the term "lands and crops";
10. that the engineer should, where it would be advantageous, be required to show assessments in the fractional part of the whole cost as well as in money;
11. that the engineer be given authority to make block type assessments in built-up areas;

12. that the engineer not be permitted to attend the Court of Revision unless specifically requested by an appellant; where such a request is not forthcoming the engineer should be required to file with the Court of Revision a statement in writing in which he gives his reasons for the appealed assessments;

THE DRAINAGE SUPERINTENDENT PART X pp. 45-46

The Committee recommends:

1. that every municipality which undertakes projects under The Drainage Act be required to engage a drainage superintendent. Two or more municipalities may jointly retain a drainage superintendent or one municipality may engage a part-time superintendent providing he is qualified;

2. that the drainage superintendent be required to report periodically on the condition of all drains within the municipality;

3. that the drainage superintendent be required to successfully complete a course of study satisfactory to the Ministry of Agriculture and Food;

4. that the salary of the drainage superintendent be borne by the general rate of the municipality and that this salary be subject to the normal grant structure available from the Ministry of Agriculture and Food.

MAINTENANCE, REPAIR AND IMPROVEMENT PART XI pp. 47-48

The Committee recommends:

1. that legislation more clearly define maintenance, repair and improvement in drainage works as outlined in part XI of this report;

2. that the functions of maintenance, repair and minor improvements continue to be undertaken without the report of an engineer;

3. that normal grants from the Ministry of Agriculture and Food be extended to maintenance, repair and minor improvements;

4. that the programs of maintenance, repair and minor improvements be permitted to be initiated by the drainage superintendent with the approval of the municipal council;

5. that major improvements be permitted to be effected by the passing of a by-law and the appointment of an engineer;

6. that in cases of major modification an environmental impact statement and benefit/cost report be filed along with the engineer's report;

7. that council be permitted to authorize as well as the environmental impact statement and benefit/cost statement a preliminary engineering study before proceeding further;

8. that normal grants be made available from the Ministry of Agriculture and Food for the cost of these preliminary studies;

9. that the procedure for processing a project which has been activated on notice of an affected owner or a road superintendent or on recommendation of a drainage superintendent be as outlined in the text;

THE APPEAL PROCEDURE PART XIII pp. 52-56

The Committee recommends:

1. that fundamental changes in the appellate system be made;

2. that the Court of Revision be retained to entertain appeals from assessments in the engineer's report;

3. the establishment of an Ontario Drainage Appeal Tribunal which would exercise all the present appellate jurisdiction of the county court judge and the referee;

4. that powers to grant mandamus, injunctions and quash by-laws and to entertain claims for damages not be given to the Ontario Drainage Appeal Tribunal but should be exercised by the ordinary courts;

5. that the Ontario Drainage Appeal Tribunal should hear appeals from allowances granted by the engineer;
6. that the jurisdiction of the Tribunal be specific;
7. that the rights of appeal to the Tribunal should be contained in one part of the Act and state each right as mentioned in part XIII of this report;
8. that an appeal to the Divisional Court be preserved;
9. that since no decision of the Drainage Tribunal should be considered absolutely final, the jurisdiction of the Divisional Court be extended to include an appeal from any decision of the Tribunal;
10. that uniform time limits be adopted for appeals which depend not on the nature of the appeal but rather on the character of the Tribunal to which the appeal is taken;
11. that in cases of appeal to the court of revision notice must be given at least 10 days before the first sitting of the court;
12. that cases of appeal to the Ontario Drainage Appeal Tribunal should be taken within 20 days after the notice of the decision or action complained of has been given;
13. that notice of appeal to the Divisional Court be given within 30 days after the date of the Tribunal's decision;
14. that the operation of the Tribunal must be expeditious, easily accessible, flexible, informal and have the necessary expertise to handle questions of an assessment, engineering or a legal nature as they arise;
15. that members of the Ontario Drainage Tribunal not be limited in number so that any number can be appointed as may be necessary as the work load increases;
16. that on an appeal to the Tribunal from the Court of Revision or on an appeal to the Tribunal by a landowner from allowances granted by the engineer, that the engineer should be required to give his evidence first;
17. that the Tribunal be given the power to govern its procedure and make rules and that such rules should be as few as possible;
18. that the Tribunal should have the power, either of its own motion or on the application of any party, to require a statement of particulars respecting the grounds for appeal;
19. that the reasons for decision of the Tribunal be required to be filed with the Ministry of Agriculture and Food as well as with the immediate parties to the appeal.

THE DRAINAGE ACT PART XV pp. 59-65

The Committee recommends:

1. that definitions of "benefit", "engineer", "drainage works", and "public utility" be redrafted as suggested in the text;
2. that the concept of "injuring liability" be deleted from the definitions in the Act and removed as a concept in the assessment responsibility of the engineer in section 16 (2);
3. that written agreements made under section 2 of the Act regarding drains constructed by mutual consent should be required to be registered in the proper registry or land titles office;
4. that section 4 (4) of the Act be rewritten to clarify that the point of commencement of the drainage works is the upstream end of the works as opposed to its point of outlet;
5. that the procedure for bringing an award ditch under the provisions of The Drainage Act be set out;
6. that authority be given to contractors engaged in the construction of drains to enter on private property and that the fine for contravention of this section of the Act be increased to \$200;
7. that, where a landowner has been compensated for flooding of his land in lieu of carrying the drain to a sufficient outlet, a copy of the by-law be required to be filed in the appropriate registry or land titles office;

8. that agreements be drawn up between the Minister of Agriculture and Food for Ontario and his counterpart colleagues in the provinces of Quebec and Manitoba which would provide the necessary machinery for drains which cross provincial boundaries, and that the Act be amended to permit agreements which cover more than one project;
9. that where owners of subdivided land can mutually agree on the share each should pay of the drainage assessment then the appointment of an engineer not be required;
10. that statements or certificates of taxes or statements of tax arrears include the amounts due on municipal drainage and amounts due on borrowings under The Tile Drainage Act;
11. that the tax rolls be amended immediately after the passing of the by-law by third reading to denote the fact that a drainage assessment is pending;
12. that municipal councils give notice to the engineer that he will forfeit all claims for compensation unless his report is filed within the specified time limit, not to be less than 30 days;
13. that the municipal clerk be required to forward all the required notices and copies of reports within 20 days after the engineer's report has been filed;
14. that where all concerned, including the council and the engineer, are satisfied that modifications or amendments to an engineer's report are in order that the report need not be referred back to the engineer. Instead the report may be adopted as amended;
15. that where changes in the engineer's report regarding design and structure become apparent after the by-law has been passed, council should have the right to apply to the Ontario Drainage Appeal Tribunal for an appropriate amendment to the report;
16. that costs be eliminated by sending to neighbouring municipalities and landowners only the facts of the by-law dealing with finance and not necessarily repeating what has already been submitted in the original distribution of the engineer's report;
17. that lands normally exempt from taxation should not be exempt from assessments for drainage works, on the principle that those who benefit from the drain should be assessed and pay that assessment;
18. that where the lands within a municipality are liable for assessment the council should be able to provide that the engineer may designate the affected area or areas and set out a block assessment on these lands;
19. that sections of the Act dealing with obstruction of, or injury to, or destruction of a drainage works and the penalties therefor and the right to sue for such damages should be in one section of the Act;
20. that, if before construction has commenced, it appears that the actual cost of the drain will exceed the original estimate by 33⅓% or more, the council must obtain the approval of the assessed owners before proceeding with the work. If construction has commenced, the municipalities involved should be able to raise funds by passing amending by-laws, but within 30 days after completion of the work the engineer and the drainage superintendent should be required to file a statement containing a summary of the matters which cost more or less than the original estimate, the reasons for the increase or decrease, and a statement of how the monies were spent;
21. that fines for pollution of drains by any matter other than drainage water be a minimum of \$100 in the first instance and \$500 on second and subsequent offences;
22. that lands owned by the ARDA Directorate of Ontario not be considered lands owned by Ontario for the purposes of grants under The Drainage Act;
23. that no change be made in the grant structure as presently set out in section 64 of The Drainage Act;
24. that when lands which have received a grant for drainage purposes are taken out of agricultural use that the grants be repaid;
25. that any person be entitled to obtain a certificate from the Ministry of Agriculture and Food which will indicate the amount of grant which has been paid with respect to any land.

THE TILE DRAINAGE ACT PART XVI pp. 66-67

The Committee recommends:

1. that the total amount available under the Act be raised from 75% to 90% of the total cost of the works and that councils not be permitted to lend a lesser amount unless a lesser amount is applied for;
2. that money loaned under this Act be loaned at no interest;
3. that artificial barriers to land drainage, that is, roads, highways, underground installations etc. should bear the additional costs of carrying field underdrainage to a sufficient outlet. Normal subsidies should apply in these cases and these subsidies should only be available where the plan has been drawn or approved by the Ministry of Agriculture and Food;
4. that where tile drainage loans are made on farm land that within the term of the loan is converted to any use other than agriculture the balance of the loan should become immediately due and payable.
5. that repayment installments of tile drainage loans should fall due annually and on the first due date of the normal taxes for the year;
6. that the first payment should be due in the year following the date in which the loan is granted;
7. that the inspector described in The Tile Drainage Act be required to file with his certificate a sketch indicating the location and direction of the tile as laid as well as information on spacing and depth of the tile.

THE ROLE OF THE ONTARIO MINISTRY OF AGRICULTURE AND FOOD PART XVII p. 68

The Committee recommends:

1. that the Ministry of Agriculture and Food be given a greater role in the administration of The Drainage Act;
2. that a separate drainage branch within the Ministry of Agriculture and Food be organized and that drainage activity not be a section within another branch.

SPECIAL PROBLEM AREAS PART XVIII pp. 69-78

(a) Matters under Federal jurisdiction

The Committee recommends:

1. that the definition of "public utility" in The Drainage Act be amended to include "railway";
2. that the Government of Ontario negotiate with the Government of Canada with a view to amending the legislation that incorporates the Bell Telephone Company (or the Railway Act, if appropriate) to make the company's position the same as provincially controlled public utilities;
3. that appropriate amendments be made to The Drainage Act to place Indian Reserves in the same position as other lands provided that appropriate amendments to the Indian Act in conjunction therewith, are also enacted by the Parliament of Canada;

(b) Euphrasia Township Municipal Drain No. 1

4. that The Drainage Act be amended to provide that no injunction shall be issued to restrain the construction of a drain that has been authorized in accordance with The Drainage Act and is being constructed in accordance with a valid by-law of a municipal council;
5. that the Minister of Agriculture be made a party to any proceedings commenced to obtain an injunction to restrain the construction of a municipal drain and that the Minister be permitted to participate in the trial and to take any proceedings that any other party could take including appeals;
6. that to resolve the peculiar situation of the Euphrasia Municipal Drain No. 1, that the Legislature pass special legislation as discussed in the text;

(c) Qualifications of Engineers and Land Surveyors

7. that the Association of Professional Engineers and the Association of Ontario Land Surveyors initiate an effective means of determining those individuals or firms which are properly qualified to practice land drainage under The Drainage Act;

8. that the professional associations take the necessary steps to establish and define the qualifications of drainage engineers;

9. that the University of Guelph consider the feasibility of offering a full-term course in drainage engineering as one of its options to senior students;

10. that the Ministry of Agriculture and Food become the qualifying body if the professional associations involved do not develop a satisfactory system of designation which would protect all concerned;

(d) Beaver in Drainage Ditches

11. that, where in the opinion of the Drainage Superintendent, a drainage works constructed under The Drainage Act, is being damaged or rendered ineffective by the activity of beaver, he report this fact to the district office of the Ministry of Natural Resources and that the Ministry of Natural Resources be responsible for taking the necessary measures to eliminate the animal permanently from the drainage works;

(e) A Suggested Regional or County Drainage Commission

12. that where municipalities in a county or a region agree, and by by-law so authorize, a county or regional drainage commission be organized to direct and supervise and control all drainage works in the county or region, but only those in municipalities where the municipality has agreed to turn over its responsibilities;

(f) Barriers to Agricultural Drainage

13. that funds be appropriated by the Legislature into the budget of the Ministry of Agriculture and Food in sufficient amounts to provide a subsidy matching the present road subsidy to county and township road budgets to provide for the necessary crossings of county and township roads by drains constructed under The Drainage Act;

14. that an amount be provided within the budget of the Ontario Ministry of Agriculture and Food to provide for payment of assessments made against provincial highways.

WATER MANAGEMENT — A PLAN FOR THE FUTURE, PART XIX pp. 79-82

The Committee recommends:

1. that the Government of Ontario establish a task force or committee to study the future management of water in the province with one of its terms of reference, being the possibility of consolidating total water control in the province into one Ministry.

I. AGRICULTURAL LAND DRAINAGE — OBJECTIVES AND BENEFITS

Agricultural land drainage may be defined as the removal and disposal of excess water from soil in order to increase its agricultural capability. Excess water may come from normal precipitation, snow melt, overland flow or underground seepage from adjacent areas, artesian flow, flood water from channels, or water applied for special purposes. The removal of excess gravitational water from the soil can result in changes in soil properties such as greater availability of capillary water, warmer soil temperature, and improved soil aeration, all of which are beneficial to agriculture.

The knowledge that benefits derive from disposal of excess water from agricultural lands is not a new discovery. References to land drainage can be found from the second century B.C. in Egypt and Babylon. The Roman statesman Cato knew of the benefits of drainage when he said "Wherever the water stands amongst the growing corn, or in other parts of the corn fields or in the ditches or where there is anything that obstructs its passage, that should be removed, the ditches opened and the water let away."

In the third or fourth century A.D., the Romans were the authorities on drainage and their methods were practised without much improvement for more than a thousand years. In sixteenth-century England a publication appeared which held forth on "How to Drain Moores, and All Other Wet Grounds or Bogges, and Live in Dry Forever."

Although open drainage ditches were commonly used in those days, samples of underground tile still exist which can be traced back to the ancient city of Ephesus and almost to the time of Christ. Tiling and draining became commonplace in nineteenth-century England and from 1820 on there is evidence of considerable knowledge and interest in tile draining in northern New York and adjoining agricultural areas.

The principal objective of drainage is, of course, to increase yields, improve crop quality, and improve the condition of the soil. Another objective is to change wet lands now considered to be merely waste into productive agricultural acreage. A third objective is to improve conditions in wet fields so that cultivation and harvesting become more profitable.

Four essential elements are required in soil for optimal plant growth — water, heat, air, and plant food. If these elements are in proper balance in the soil, then maximum crop production obviously is feasible. Land drainage controls the amount of water in

the soil and maintains it in such condition that root growth is at its deepest and does not suffer from the wet and cold. Crops need air as well as water, and so the water from the upper few feet of the soil must be removed to allow air which carries vital oxygen to reach the growing plants.

Soil temperature plays an important role in seed germination and root growth. Saturated soils largely use solar radiation to evaporate water rather than to raise soil temperature. By removing excess water, drainage enables the soil to warm up more quickly.

Plant food in the form of fertilizer is dissolved in moisture and taken up by plants. Since this activity takes place only above the water table, proper drainage of the soil is necessary to increase the availability of plant food through the roots.

Land drainage facilitates the removal of gravitational water from the soil. Gravitational or free water forms that fraction of soil water which is in excess of the soil's moisture-holding capacity. This water normally drains downwards with the force of gravity. In areas of high water table, however, gravitational water remains on or just below the ground surface. Drainage lowers the water table and removes this excess water. Capillary water, which forms a film around each soil particle, is retained against the pull of gravity and cannot be drained off. It is capillary water that is used by plants, and removing gravitational water actually increases the amount of available capillary moisture in the soil.

Removing excess water improves soil structure because it allows increased activity by microorganisms, greater plant root development, and less shrinking and swelling action which occurs with changes in soil moisture content. The improved soil structure enables the soil to hold greater amounts of capillary water. Furthermore, lowering the water table encourages plant roots to penetrate deeper into the soil, providing access to a greater amount of capillary moisture. Increased rooting depth also enables plants to utilize nutrients from a greater volume of soil.

Benefits from land drainage have been compiled by agricultural soil scientists and may be summarized as follows: (1) earlier planting and harvesting is possible; (2) the growing season is lengthened; (3) by increasing the depth of the root zone, more available moisture and plant food is provided; (4) the soil is better ventilated; (5) soil erosion is decreased by increasing water filtration; (6) soil bacteria grow

better; (7) organic salts are leached from the soil; and (8) soil temperatures are increased.

The Ontario Soil and Crop Improvement Association has for many years promoted the practice of proper land drainage. Some of the local county associations have conducted experiments and produced statistics to prove that land drainage is highly beneficial in terms of increased crop yields and better soil management. The Committee appreciated the many well-presented briefs received from county soil and

crop improvement associations on the subject of land drainage.

The Canada Department of Agriculture conducts research in land drainage through the facilities of its experimental station at Harrow, Ontario and has demonstration plots in Essex and Lambton counties. The Interim Report of this Committee tabled in the Legislature on December 4, 1972, recommended that more demonstration plots be set up in northeastern and northwestern Ontario to allow farmers to see on the ground the actual benefits of land drainage.



Improperly drained cultivated land.



A good crop on well-drained land.

II. THE LAW OF DRAINAGE — PAST AND PRESENT

The Common Law

In order to gain appreciation of the complex statutory scheme which governs drainage matters in Ontario today, it is useful, indeed necessary, to have some knowledge of the basic values of the common law regarding drainage and watercourses. Most of these principles are very old, and were developed by the courts before any statutory provisions regarding drainage were enacted. It must be remembered, however, that the principles of the common law continue to be in effect unless they are specifically altered or overridden by statutory enactment — thus their continuing importance.

The common law regarding drainage may essentially be divided into two parts. First, there are the rules governing the rights and obligations of riparian landowners, in other words those whose lands are immediately adjacent to natural watercourses. The second set governs the rights and obligations of landowners which relate to surface waters.

When considering the rights of riparian owners, it should be noted that a natural watercourse has been defined by the courts as a channel with banks formed by the flowing of water and must present to the eye the unmistakable evidence of running water. 1/ The courts have held that a watercourse is established if there is a sufficient natural and constant flow of water to form and maintain a distinct and definite channel. It is not necessary that the water be continuous or from a perennial living source. It is sufficient that the water rises periodically from natural causes and reaches a plainly defined channel of a permanent character. 2/

Any landowner whose lands abut upon a natural watercourse has a right to drain his lands into that watercourse. 3/

Where a landowner with lands abutting on a natural watercourse collects the rain in ditches or in proper drains, he has the perfect right to discharge it into the watercourse. And this is so even though the result is to increase the volume of the stream and to accelerate its rate of flow. He may do so without incurring any liabilities for damages to an owner of a lower land. 4/ The lower owner must live with the possibility of increase in the flow of the stream because the upper owner has the advantages of drainage reasonably used which the stream may give him. By reasonable use is meant use up to the capacity of the banks of the stream.

1/ *Re Sinclair and Sharpe* (1924), 26 O.W.N. 134.

2/ *Beer v. Stroud* (1888), 19 O.R. 10.

3/ *McGillivray v. Lochiel* (1904), 8 O.L.R. 446.

4/ *Ibid.*

But rights also call for certain obligations. A natural watercourse from its very nature must flow from higher to lower ground, and if there is a right of the high lands to drain, then there is a corresponding obligation on the owners of the low lands to accept the flow. Subject to the limitations placed upon the upstream owners that they must use the stream reasonably, their rights to drain lands which lie within the watershed is absolute. Conversely the downstream owner is under an obligation just as firm that he will accept the disadvantages which flooding brings to his low land.

It is the duty of anyone who interferes with the course of a natural stream to see that the works which he substitutes for a channel provided by natural means are adequate to carry the water which may be brought even by extraordinary rainfall. If damages result from improperly substituted works which have been provided in place of the natural stream, then the owner is liable. 5/

The second division of common law deals with water that from time to time descends in the form of rain until it finds its way by percolation or flow to the point of commencement of some natural course. To summarize the rules in respect to surface flow and percolation it may be said that as far as owners of low land are concerned, they cannot claim the assistance of the law to prevent the natural flow of surface water from adjoining high land. However, they are not obliged to receive surface water flowing upon their lands. The low landowner may without liability protect his own lands by building structures or by filling the land to a height sufficient for protection, and the upper landowner has no complaint if flooding results. 6/

The character of water changes in law when it is collected in a man made channel and therefore, a person who collects water in an artificial channel loses any right he may have had in respect to uncollected surface water. The minute he does so makes him liable to avoid venting this collected water on the lands of another, and he must at his expense take the water to a sufficient outlet. 7/ Hence the contribution in The Drainage Act by those assessed for "outlet" where the drain is so constructed to carry water off from the lands of higher owners.

The Statute Law

Drainage statute law in Ontario goes back almost 140 years. There have been many amendments to the law

5/ *McArthur v. Gillies* (1881), 29 Gr. 223.

6/ *Ostrom v. Sills* (1898), 28 S.C.R. 485.

7/ *Re Orford and Aldborough* (1912), 27 O.L.R. 107.

during that period, arising in piecemeal fashion in response to particular problems. Accordingly, there now exists a system of drainage law that is extremely complex and sometimes unwieldy and is really a system of patching on a basic statute. The changes made over the years were in response to different demands from various areas in the Province, as the pace of drainage construction increased and also to demands and difficulties encountered by farmers, engineers, lawyers, and municipal councillors. It is fair to say, however, that the development of drainage law in Ontario has been a basic process with very few major reconstructions or departures from the original idea. Legislators and people involved had what they considered to be an adequate system and the amendments were brought about with a view to improving that system.

The first statute law affecting drainage in Ontario was passed in 1835. The Statute was entitled "An Act to Regulate Line Fences and Watercourses," and it set out the basic framework which we know today; i.e., that the cost of the construction was to be borne in proportion to the interests of the individual's concern. It is interesting to note that at the time of introduction this legislation was given a four-year trial period, but at the end of this trial period, the legislation was extended indefinitely.

This Act continued in force until 1859 (25 years), but in that year a new Act was passed respecting municipal institutions in Upper Canada. This Act contains the outlines of the present Drainage Act. A petition by interested landowners for construction of a drainage works was instituted; the appointment of an engineer was ordered; the passing of a by-law and the assessment of land which benefits and the permission of the council to issue debentures for payment was included as well as provisions for appeal to the County Court Judge. Interestingly, before the work was to begin, the council was required to publicize in the local press for at least a month the fact of the work and the by-law authorizing it. This is not required today.

In 1874, all previous acts were repealed and a new act was introduced entitled "An Act Respecting Ditching and Watercourses." This Act consolidated all preceding acts and the only innovation was the authority to appoint a registered Ontario Land Surveyor.

Two further pieces of legislation aided the development of drainage in Ontario. The first one established the Ontario Department of Public Works and gave it the important responsibility of constructing drainage works in swampy areas. The government was given in this way the initiative to drain certain areas without the necessity of a petition. At the same time, the government began to realize the costs of completing these drainage works and to recognize that the high cost of construction was preventing farmers from draining lands by way of a petition. In an attempt to remedy this situation, legislation was passed allocating funds to be spent on drains constructed under the Public Works Department. These

moneys, however, were in the form of loans, and the lands benefited were to be charged under a difficult formula to recover the money after the drain was constructed. Thus, initiating municipalities submitted the proposed drainage schemes to the Public Works Commissioner, who then referred them to the Cabinet, which then authorized the investment of funds.

The Act was rewritten in 1871 and the Commissioner of Public Works was empowered to act on the written application of a municipal council that had received a petition of the majority of owners of land benefited by the drain. Then moneys were specifically allotted for drainage works.

The requirement for a sufficient outlet goes back to 1884, when the Act of 1871 was amended requiring that every drain be continued to a sufficient outlet. The Act held that it was lawful to construct a ditch or a drain through any number of lots until a sufficient outlet was reached.

The procedure for resolving disputes in those days was essentially a form of arbitration. It has been reported, however, that local men with a knowledge of general municipal politics were appointed as arbitrators but not necessarily because of their ability to give judicial and independent thought to the matters before them. This, of course, led to many long and bitterly contested arguments. The office of drainage referee was established in 1891, and given the powers of the arbitrators who originally sat on these cases.

In 1892, the first Commission was appointed to look into drainage laws in Ontario. Two suggestions were made to this Commission in 1892, which have some relevancy today. First, it was recommended that drainage matters should be taken out of the hands of the local municipalities and placed under the control of a board to be appointed by the Lieutenant-Governor-in-Council. Second, it was made quite clear that it was very difficult to decide which lands were benefited by the drain until the engineer had made his report. It was recommended that the engineer's report should be made and presented to the council who then would decide on the validity of the petition. There was some concern at that time about the role of the engineer, as there is today, and it was suggested that the engineer's duties be more precisely described in the Act. Many of the amendments recommended by the Commission of 80 years ago appear in today's Drainage Act, but again, were minor amendments to the existing legislation and did not really constitute a sweeping change.

The Commission of 1892 certainly did not envisage what then happened. The legislature took it upon itself to repeal certain acts then in existence and to consolidate them into a new Municipal Drainage Act, a course which had not been recommended by the Commission.

Thus, the advent of the Municipal Drainage Act in 1894 was the most important event in the evolution of the drainage statutes until the present. This Act prov-

ided for two drainage referees: one for western Ontario and one for eastern Ontario.

One of the most difficult conflicts in the development of drainage law in Ontario has been that between the need for engineering expertise and the inherent suspicion among farmers and others that the engineer's professional opinion was unnecessary, too expensive, and just as prone to error as that of the inexperienced layman. The legislation required that drainage reports must be provided by a professional engineer or an Ontario Land Surveyor. In 1903, distrust of engineers became apparent when amendments to the Act provided for any municipality to appoint two residents as drainage viewers. These viewers were to accompany and assist the engineer in all his duties. If one of the viewers and the engineer could agree in case of a dispute, that would be sufficient. What usually happened, however, was that, if both the drainage viewers disagreed with the engineer, the report was effectively thrown out. In less than 10 years, the provision for drainage viewers was removed from the Act.

Two referees had been appointed under the Act of 1894. On the death of the Western referee, however, no new appointment was made and the referee from Eastern Ontario, G. F. Henderson, Q.C., of Ottawa, carried on alone and served the whole Province. Henderson's philosophy was that the legislation was designed to get drains dug and not to write books on cases of appeal and litigation. He successfully cut down the amount of argument in formal cases before him and settled many cases by urging people to use their common sense instead of bringing formal action. In 1926, he is reported to have told the Premier that the only work he had done in the last year was to sign a few cheques. As the caseload before the referee diminished, consideration was given to dispense with the office. In 1946, amendments were introduced to allow the Ontario Municipal Board to fulfill the referee's functions.

A second Commission or Committee of the legislature was appointed in 1948, consisting of George Parry (Chairman) from Kent West, Bryan Cathcart from Lambton West, and Ross A. McEwing from Wellington North. This Committee traveled extensively throughout the Province asking for suggestions and recommendations. The amendments they suggested were aimed at closing loopholes and adding a few necessary procedures. They did not feel that any radical restructuring of the Act was necessary.

The Committee reported dissatisfaction with the work of the Ontario Municipal Board as drainage referee and recommended that a well-qualified lawyer with considerable experience in drainage should be appointed to the Municipal Board or, alternatively, that such a person be named as referee. Although this suggestion was not accepted, a drainage referee was appointed at this time and an option was given as to where disputes could be taken.

The Committee's main contribution concerned the relationship between drainage and the problems of

conservation and flood control. They recommended that "in order to safeguard watersheds from the development of unwise drainage schemes, there should be some overall neutral authority with power to review drainage schemes from the standpoint of the whole watershed involved." Many of this Committee's recommendations were enacted in the following legislative session in 1949. Some of their recommendations on conservation and flood control were recognized but not exactly in the form they suggested.

In the early 1960's, drainage laws in Ontario were numerous and not entirely related to each other. In some cases they even were administered by different departments. This confusion and division of responsibility was at least partially responsible for the establishment of a Committee of the Cabinet consisting of Honourable W. Spooner, Honourable F. Cass, Honourable W. A. Stewart, Honourable C. McNaughton, and Honourable R. Connell. Their responsibility was to make recommendations on farm drainage and determine whether all aspects of farm drainage might be administered under one department. This Committee set up an Advisory Committee made up of Professor R. W. Irwin of the University of Guelph, Colonel S. W. Archibald, P.Eng., and R. D. Steele, Q.C. The Advisory Committee was not given much time to do its work, but it consolidated the Province's drainage legislation and again did so without substantial alterations.

The Advisory Committee was confronted with six Acts dealing with drainage and did what Professor Irwin called "an elaborate exercise with scissors and paste." A new Drainage Act was drawn up with the recommendation that it be administered within the Department of Municipal Affairs.

The present Drainage Act which resulted is a complex, often difficult, piece of legislation which, in its bare essence, provides for the authorization of the construction of drains by three routes: (1) private drains by agreement (Sec. 2); (2) petition (Sec. 3); (3) requisition (Sec. 4). The construction of drains upon requisition under Section 4 is rarely used. It is restricted to agricultural lands, the maximum cost of construction cannot exceed \$2,500, and no grants are payable with respect to such drains.

The most common method of authorizing the construction of drains under the Act is by petition under Section 3. The majority of the owners of land in the area requiring drainage may petition the council of a municipality for the construction of drainage works. The council may appoint an engineer or Ontario Land Surveyor to make an examination of the area, and to prepare a report, including plans, specifications, estimates, and an assessment of the cost of the works against the lands to be benefited. The engineer is required to provide for the construction of bridges and culverts, and to make allowances for severance and damage. The report is considered by the council and, if appropriate, is adopted and incorporated in a provisional by-law. Any person dissatisfied with the assessment can appeal to the court of revision, which

is appointed by the council, and he may appeal from the court of revision to a county court judge. An appeal may be taken from the report of the engineer directly to the referee. The referee also has general jurisdiction in drainage matters, and has power to issue a mandamus or an injunction, quash by-laws, and entertain claims for damages.

Five of the Acts were repealed, leaving, the Province with two major drainage statutes — The Drainage Act and The Tile Drainage Act. In 1972, drainage legislation was made the responsibility of the Ministry of Agriculture and Food.

One of the first acts of the present Minister of Agriculture and Food, the Honourable William A. Stewart, when these Acts were placed under the jurisdiction of his Ministry, was to recommend to Cabinet that a Select Committee of the Legislature be constituted to review the drainage law. The present Committee was established on June 30, 1972 as a result of that recommendation.

The Agricultural Tile Drainage Installation Act (S.O. 1972) as proclaimed in April, 1973, provides for the licensing of contractors, operators and their machines engaged in the installation of field tile for underdrainage of farms. Since little experience had been gained by the Ministry of Agriculture and Food, the Committee has no comment to make on the working of this relatively new piece of legislation.

Other Legislation Affecting Land Drainage in Ontario

As noted above, there are three major pieces of legislation administered by the Ministry of Agriculture and Food but the Committee's research has revealed 20 other pieces of legislation which have relevance to or impinge on the three specific drainage Acts. These Acts and their titles are listed in Appendix III. The relevance of these Acts to drainage is inconsequential in some cases. Some are inoperative or obsolete for certain reasons but some definitely present problems of conflict.

Section 33 of The Drainage Act states that an appeal lies from the Court of Revision to a County Court Judge. It then goes on to say that the provisions of the Assessment Act as to appeals to the Judge under Section 55 of that Act apply mutatis mutandis to an appeal under The Drainage Act, with the exception that the notice of appeal shall be given to the clerk of the municipality instead of to the assessment commissioner. Upon receiving this notice the clerk of the municipality then assumes the duties of the regional registrar as outlined in The Assessment Act.

The Conservation Authorities Act (R.S.O. 1970, Ch. 78), establishes authorities whose responsibility is to further conservation, restoration, development and management of natural resources. The powers of the conservation authorities are set out in Section 20 and a reading of these powers indicates that they are sufficient to allow conservation authorities to establish a scheme which might interfere with a municipal drain.

Under the Drainage Act, municipalities are required to notify conservation authorities of any drainage works proposed and the authority has the right of appeal to the drainage referee on any scheme affecting lands owned or under the jurisdiction of the authority.

The Environmental Protection Act (S.O. 1971, Ch. 86) is designed to prohibit the introduction of unauthorized contaminants in the natural environment. This Act may have some relevance when it is realized that during construction of a drain certain silting and sediment might have detrimental effects downstream. There is a possibility of conflict here in that it might be argued that under this Act, a drain could be stopped because of the introduction of a contaminant into the natural water course. However, there is some question about whether silting and sediment and other construction matter would be considered a contaminant.

The Public Transportation and Highways Improvement Act (S.O. 1971, Ch. 61), empowers the Minister of Transportation and Communications to carry out works for proper drainage of highways and any work so carried out must be done only with consent. A road superintendent under this Act has the power to commence proceedings under The Drainage Act and this is complemented by the section of The Drainage Act which allows a road superintendent to initiate a drain by notifying council.

The Local Improvement Act (R.S.O. 1970, Ch. 255). There is some question as to whether this Act has applicability to agricultural land drainage, but if the definition of a sewer in the Act can be interpreted to include a drain, then there is obviously some application. However, it is doubtful whether the word "sewer" in the Act can be so construed.

The Municipal Act (R.S.O. 1970, Ch. 284), has immediate relevance to the problems of drainage and Section 23 of this Act deals with the problems encountered when lands specially assessed under The Drainage Act become part of a new municipality, or are annexed to another municipality.

Section 293 (3) of The Municipal Act exempts any by-law passed under The Drainage Act from the provisions of subsection 1, which states that a municipal corporation cannot incur a debt, the payment of which is not provided for in the estimates of the current year unless a by-law authorizing it has been passed with the consent of the electorate.

Sections 352, 354 and 363 of The Municipal Act enable councils of municipalities to pass by-laws which may relate to drainage and water problems. The most important in this respect is Section 352 and particularly paragraph 16. This section authorizes councils of all municipalities to pass by-laws for constructing, maintaining, improving, repairing, or widening a drain, sewer or water course and for acquiring land in or adjacent to the municipality for such purposes. Before passing any by-law under this section, the Council may require an engineer's report

to be made with or without a survey and the cost of this report, as well as the cost of the work itself may be levied against all the ratable property in the municipality, or in a defined area of that municipality which in the opinion of the council derives special benefits. It would thus appear from a reading of this section that any municipality in Ontario can pass a by-law to do any of the things a council can do under The Drainage Act, without the requirement of a petition. In fact, it should be noted that the council has a discretionary power as to whether or not an engineer's report is required and also a discretionary power with respect to financing.

It has been suggested in some quarters that it is doubtful that these provisions are wide enough to allow the type of drainage being constructed as is constructed under The Drainage Act since the authority of councils in this case is limited to specific purposes and no other. We believe, however, that municipalities in Ontario do have ample authority to undertake drainage schemes under The Municipal Act which are similar to those contemplated by The Drainage Act.

The only major distinction between the powers conferred under The Drainage Act to build drains under petition and the powers conferred by The Municipal Act to build drains authorized by Council without a petition, is that the former process is supported by the Province of Ontario through a grant mechanism whereas under The Municipal Act no

such grants are available. Therefore the likelihood of extensive drainage works being constructed under The Municipal Act is remote.

The Municipal Act also permits municipal councils of a certain size to pass by-laws which license and regulate the operation of drainage contractors and drain layers. There is a possible conflict here between the licensing authority of the Agricultural Tile Drainage Installation Act and Section 383, subsection 3 of The Municipal Act.

The requirements of the Ontario Municipal Board Act with respect to drainage by-laws do not conflict with The Drainage Act but rather supplement and complement it. It is clear that all municipalities are required to obtain the approval of the Ontario Municipal Board before finally passing any provisional by-law authorizing the construction of a municipal drain if the cost is to be spread over a number of years or if debentures are to be issued. If that drain is to be wholly or partially financed by the issue of debentures then the validity of the debenture must be certified by the Board and is for all purposes, valid and binding upon the municipal corporation.

The Ontario Water Resources Act (S.O. 1972, Ch. 1), appears to give authority to the Ministry of the Environment to control and regulate transmission of water. A strict reading of this Act would lead to the belief that the Ministry of the Environment can build drains on the authority of the Minister.



Inlet channel and pumping installation.

III. THE EXTENT OF LAND DRAINAGE IN ONTARIO

To provide background information on both the magnitude and regional distribution of drainage activity, the Committee undertook an overview of expenditures on government assisted land drainage projects for the period of 1964-72.

Government assistance programs for the drainage of agricultural land under The Drainage Act and The Tile Drainage Act were in effect throughout the 1964-72 period. In addition to the above continuing programs, other forms of supplementary programs included special grants under A.R.D.A. and from the Ministry of Agriculture and Food.

The Drainage Act of 1962-63 (S.O. 1962-63, Ch. 39) as amended up to 1970 and as revised in 1972 (S.O. 1972, Ch. 139) provides for the payment of grants from the provincial treasury amounting to 33 1/3 percent of the cost of drainage works constructed in a county, 66 2/3 percent of the cost of the works in a territorial district or a provisional county, and up to 80 percent of the cost of drainage works constructed in a territory without municipal organization. This grant program, available throughout the 1964-72 period, applied only to agricultural lands.

The Tile Drainage Act of 1960 (R.S.O. 1960, Ch. 399) as amended up to 1970 and as revised in 1971 (S.O. 1971, Ch. 37) provides for assistance in the construction of on-farm tile drainage. Assistance under this act is in the form of provincial government purchases of debentures from municipalities to enable municipalities to lend landowners up to 75 percent of the cost of tile drainage. These loans are at low interest rates (4 percent at present) and are to be repaid over a ten-year period. This assistance for tile drainage was available throughout the period studied.

A.R.D.A. Drainage Assistance

Under the federal-provincial A.R.D.A. program, additional assistance has been made available for municipal drainage work for agricultural land. Commencing on April 1, 1966, the A.R.D.A. branch of the Ontario Department of Agriculture and Food made available a grant of 33 1/3 percent in addition to the grants under The Drainage Act for drainage works constructed in the eleven counties of eastern Ontario. On January 1, 1967, this program was extended to include all of the counties in southern Ontario. This program continued until December 31, 1968, when it was cancelled due to a lack of funds. Since January 1968, A.R.D.A. drainage grants have been available only in the eleven counties of eastern Ontario.

A special case relating to the A.R.D.A. grants for municipal drainage applies to projects in parts of nine

townships (West Luther, Proton, East Luther, Arthur, Egremont, Amaranth, Melancthon, Artemesia, and Osprey) in the counties of Grey, Dufferin, and Wellington. This area was the subject of a special A.R.D.A. study in a micro-drainage area that is the source of several major river systems. This study was not completed until late in 1968. When the A.R.D.A. drainage assistance program was cancelled at the end of 1968, municipalities located within the micro-drainage study area requested an extension of the A.R.D.A. assistance based on their claim that they had not been able to fully utilize the program prior to the completion of the study. Their request was granted and A.R.D.A. grants of 33 1/3 percent of the cost of drainage works were made available in this area for projects petitioned after April 1, 1971 and for which engineers were appointed prior to March 31, 1973.

Special Agricultural Drainage Assistance

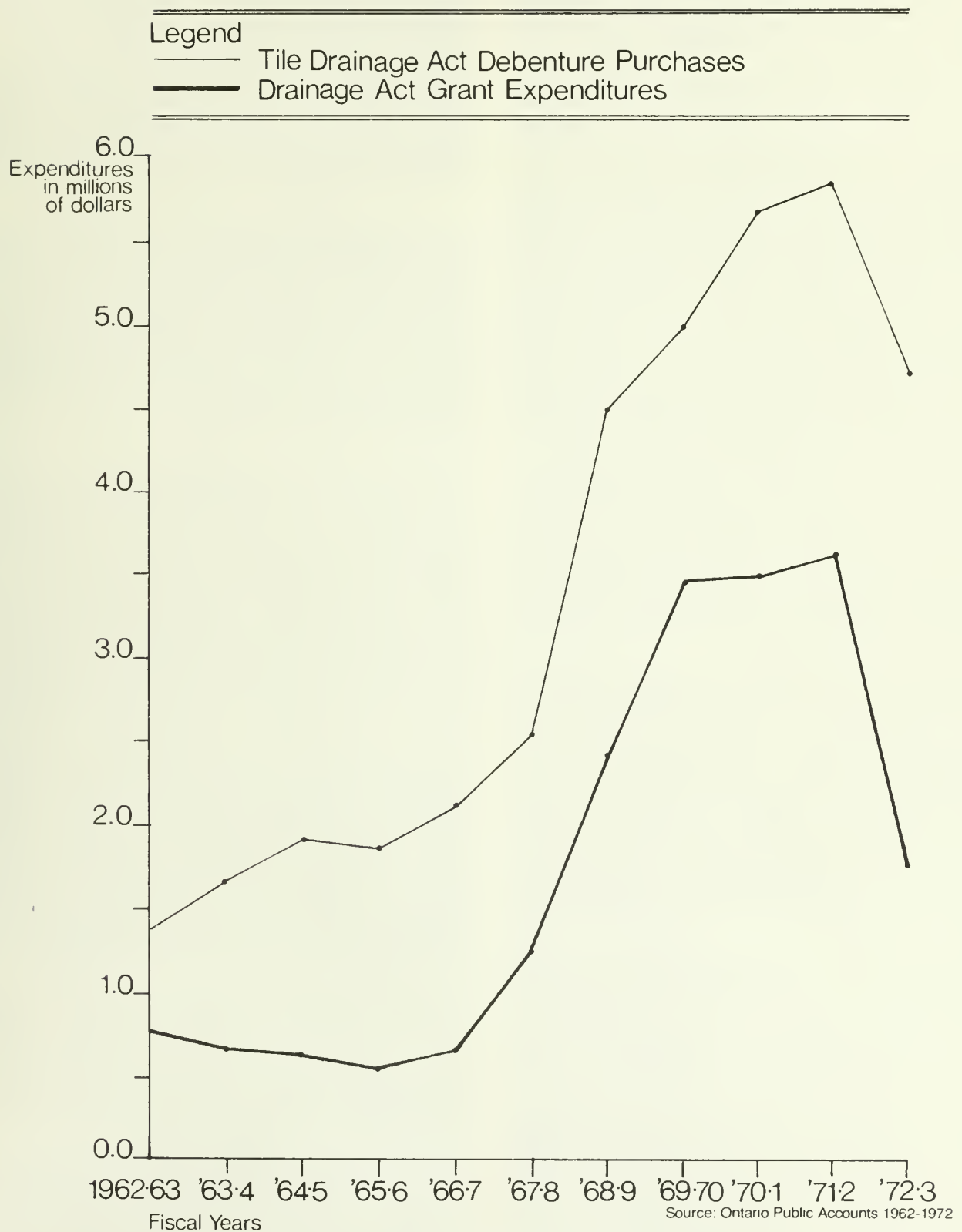
When the A.R.D.A. assistance program was cancelled at the end of 1968 for most of southern Ontario, many municipalities were in the process of initiating projects which had been petitioned by farmers expecting the A.R.D.A. grant. In June 1969, the Ontario Department of Agriculture and Food undertook to pay an additional grant of 33 1/3 percent on all drainage works petitioned prior to the termination of the A.R.D.A. program but which were constructed too late to qualify for assistance under that program. In effect, this special assistance meant that all drainage projects petitioned after April 1966 and before December 1968 were eligible for either the A.R.D.A. grant or the Special Assistance Grant of 33 1/3 percent in addition to The Drainage Act grant of 33 1/3 percent.

Capital Grants for Farm Development

In April 1967, the provincial government introduced the Capital Grants for Farm Development Program. This program provided for grants of 33 1/3 percent of the cost of drainage or permanent agricultural structures up to a maximum of \$1,000 per farmer. In 1971, the rate of assistance under this program was increased to 40 percent, up to a maximum of \$3,000 per farmer. Under this program, a farmer can obtain a grant towards the cost of tile drainage on his farm.

The graph in Figure 1 details the total grants paid under The Drainage Act for each year during the period 1962-72. During the first four years of the period, the expenditures decreased slightly from a total of \$751,194 in 1962-63 to \$567,405 in 1965-66. In 1966, the annual expenditures began to increase

Figure 1 Grant Expenditures Under The Drainage Act and Debenture Purchases Under The Tile Drainage Act, 1962-1972.



rapidly through the four-year period to 1969-70, when the total amounted to \$3,493,000. This 1969-70 expenditure was maintained through the next two years before the total dropped off to \$1,882,185 in 1972-73. The varying magnitudes of annual expenditures of grants under The Drainage Act can be related to the other municipal drainage assistance programs (assistance under A.R.D.A., for example), which were in effect for portions of the eleven-year period.

The relatively stable level of expenditures under The Drainage Act for the years 1962-63 to 1965-66 corresponds to a period when the only available assistance was that provided by The Drainage Act. The period of 1966-67 to 1969-70, in which grant expenditures increased sharply, corresponds to the period when the A.R.D.A. program and the provincial government's Special Drainage Assistance Program provided additional grants. The leveling-off period from 1969-70 to 1971-72 corresponds to a period when projects petitioned prior to December 1968 were still eligible for grants under the Special Drainage Assistance Program but when newly petitioned projects were only eligible for The Drainage Act grants. In the final year, 1972-73, when expenditures fell off, most of the projects constructed would have been eligible only for grants under The Drainage Act.

In summary, the graph in Figure 1 illustrates quite clearly the effect of additional assistance programs on the amount of drainage undertaken. Although there is a time lag, the initiation of the A.R.D.A. and Special Assistance programs corresponds to a period of rapid increases in expenditures. The termination of these programs corresponds to a period of leveling-off followed by reduced expenditures.

Drainage Act Expenditures by Township, 1964-72

To obtain an overview of the regional patterns of drainage expenditures, an analysis was undertaken of the annual expenditures at the township level. The period 1964-72 was selected for analysis to include the 1964-66 period during which expenditures were relatively stable, the 1966-69 period of rapid increase, and the 1969-72 period of renewed stability. Such an analysis of grant expenditures at the township level over the eight-year period would likely reveal regional trends in drainage activity.

The basic data employed in this analysis were the annual total of grants under The Drainage Act paid to each township in the Province. The initial stage of analysis involved a tabulation of these expenditures for each of the eight years. The results provided a picture of expenditure patterns but were limited in their usefulness by extreme year-to-year variations in expenditures, particularly in areas of limited drainage activity. To better summarize the pattern, average annual grant expenditures by townships in the southern part of the Province were calculated for the three-year periods of 1964-65 to 1966-67, and 1969-70 to 1971-72. The former period corresponds to the timespan prior to the rapid increases of 1967-69, while the latter period corresponds to the years of renewed stability after the increases.

The pattern of average annual drainage grants for the three-year period 1964-65 to 1966-67 for townships in the southern part of the Province indicate two major regions of activity — one in southwestern Ontario and the other in eastern Ontario, with a few smaller areas in the counties of Bruce, Grey, Dufferin, Wellington, and Simcoe. In southwestern Ontario, twelve townships received between \$10,000 and \$20,000 in average annual grants under The Drainage Act. Within eastern Ontario, only two townships received average annual grants over \$5,000. The data also revealed a large region with no municipal drainage activity, including the area around the western end of Lake Ontario and the area east and north from Toronto.

Grant expenditures under The Drainage Act for municipalities in the northern part of the Province were summarized for the entire 1964-72 period. The municipalities receiving grants in this part of the Province are located within provisional counties or territorial districts and therefore receive grants of 66 2/3 percent of the cost of drainage. The data indicate that during the 1964-66 period only six municipalities received grants, two of which received an average annual grant of over \$5,000.

The pattern of drainage activity for the three-year period 1969-70 to 1971-72 is similar to that of the 1963-67 period. It shows two major areas of activity — one in southwestern Ontario and another in eastern Ontario, with more isolated activity in the counties of Simcoe, Ontario, Victoria, and Prince Edward. Both areas of activity are larger than for the previous period, with the southwestern area being extended north and eastwards and the eastern area being extended north and west. The most significant change from the earlier period relates to the magnitude of expenditures. In southwestern Ontario, five townships received average annual grants of over \$60,000 and twenty-nine other townships received average annual grants of over \$30,000. In eastern Ontario, five townships received average annual grants of over \$20,000. Again, a significant lack of municipal drainage activity is observed in the area around the western end of Lake Ontario and in the area to the east and north of Toronto. There was, however, some activity in isolated townships in the counties of Ontario, Victoria, and Prince Edward.

Grant expenditures in the northern part of the Province indicate only limited drainage activity during the 1969-72 period. Only eleven townships received grants during the period, one of which received an annual average grant of over \$30,000 and one other above \$5,000. Grants in this area represent 66 2/3 percent of the total cost of the projects.

To better understand the changes in the amount and regional patterns of grant expenditures under The Drainage Act during the 1964-72 period in the southern part of the Province, analyses were made of the percentage change in the average annual value of Drainage Act grants to townships between the period 1964-67 and 1969-72. A study also was made of the

actual increase in the average annual value of municipal drainage grants to townships between the periods 1964-67 and 1969-72.

The percentage changes in the value of grants under The Drainage Act illustrate the relative changes in expenditures. Only a small number of isolated townships actually experienced a decrease in the level of expenditures and in no case were these townships that had received large grants during the 1964-67 period. Most of the townships with the highest percentage increases are associated with areas of new drainage activity which received no grants during the 1964-67 period but which did receive grants during the 1967-72 period.

These areas of new drainage activity illustrate the spread out of the two established drainage regions of southwestern and eastern Ontario. The new areas of drainage associated with southwestern Ontario form a crescent-shaped pattern that includes townships in the counties of Bruce, Grey, Wellington, Waterloo, Brant, Wentworth, and Norfolk. The new areas associated with eastern Ontario show a spread of activity west and north into townships in the counties of Grenville, Leeds, Lanark, and Renfrew and the Regional Municipality of Ottawa-Carleton. Other areas of new activity include isolated townships in the counties of Haldimand, Peel, Simcoe, Ontario, Victoria, Hastings, Prince Edward, and Lennox and Addington in the Lake Ontario area and in the areas of Nipissing and Manitoulin Island farther north. At the same time, there are many townships within the established drainage areas of southwestern and eastern Ontario that experienced large percentage increases ranging from 500 to 5,000 percent. In terms of the absolute increases in expenditures under The Drainage Act, these established areas accounted for the greatest activity.

Data on the actual increase in the average annual grant expenditures between the periods 1964-67 and 1969-72 were also tabulated and clearly show where the maximum increases in the absolute value of grants have occurred. These maximum increases are largely concentrated in the southwestern drainage area, particularly in Lambton and Middlesex counties, with less concentrations in Essex, Elgin, Huron, Bruce, and Perth counties. With only local exceptions, the magnitudes of absolute increases in the value of grants in eastern Ontario are much smaller than those in the southwest. The absolute increases in other areas of the Province are relatively insignificant compared with those in the two major areas.

It is clear that the concentration of drainage activity is in southwestern and eastern Ontario. Areas of new drainage seem to correspond to the fringes of these established areas. In terms of the absolute values of expenditures, southwestern Ontario's predominance has been well established.

Annual Tile Drainage Expenditures, 1962-72

The annual totals for provincial government purchases of debentures under The Tile Drainage Act for

the period 1962-72 are shown in Figure 1. The pattern indicates a gradual increase of expenditures during the period 1962-67 when there was a more rapid increase in expenditures from 1967-70, a leveling off to 1971, and falling off in 1972. This pattern is quite similar to that described for expenditures on municipal drainage under The Drainage Act (see Figure 1), with the expenditures under The Tile Drainage Act exhibiting a slight lag behind those under The Drainage Act. This lag is easily explained in that on-farm tile drainage projects are likely to follow the installation of municipal outlet drains.

The graph of tile drainage expenditures does not exhibit the extremely sharp breaks in slope that are associated with the graph of municipal drainage expenditures. This difference can be attributed to the fact that the initiation and cancellation of the A.R.D.A. Outlet Drainage Assistance Program did not have as direct an impact on tile drainage activity as it had on municipal drainage activity. On the basis of the graph (Figure 1), it may be hypothesized that in general the tile drainage expenditure pattern for 1962-72 is closely related to the municipal drainage expenditures, with the municipal drainage activity in most cases triggering subsequent tile drainage activity. This hypothesis is further examined in the following sections which discuss regional patterns of expenditure under The Tile Drainage Act.

Tile Drainage Act Expenditures by Township, 1964-72

To provide a basis for comparing the regional patterns of expenditures under The Tile Drainage Act and The Drainage Act, an analysis was undertaken of the annual township level expenditures under The Tile Drainage Act. The period 1964-72 was selected to correspond to that considered for The Drainage Act and to include the 1967-69 period of rapid increases in tile drainage activity. The basic data employed were the annual totals for provincial government purchases of debentures under The Tile Drainage Act from each township in the Province. The initial stage of analysis involved tabulating the tile drainage expenditures for each of the eight years. A series of four summary tables were prepared to provide a basis for comparison with The Drainage Act expenditures in some areas. These four tables, which are directly comparable to those included for The Drainage Act expenditures, are of the average annual expenditures on tile drainage debentures for the three-year periods 1964-66 and 1969-71 and of percentage differences and actual increases in tile drainage debenture purchases between the two periods.

The tabulation of the average annual value of tile drainage debenture purchases by township in the southern part of the Province during the period of 1964-65 to 1966-67 reveals a pattern of major activity in southwestern Ontario. Lesser amounts of activity are shown in the counties bordering the shores of Lake Huron and southern Georgian Bay, in the Niagara Peninsula, in a bank along the north shore of Lake Ontario, and in eastern Ontario. The largest

expenditures are concentrated in southwestern Ontario, particularly in the counties of Essex, Kent, and Lambton and to a lesser extent in Middlesex, Huron, Perth and Elgin.

The average annual value of tile drainage debenture purchases by township in the southern part of the Province for the period 1969-70 to 1971-72 is quite similar to that for the earlier period, but the magnitudes of expenditures are notably larger. The major centre of activity is still the southwest, particularly the counties of Huron, Perth, Lambton, Middlesex, Essex, Kent, and Elgin. There is a considerable increase in activity in eastern Ontario as well as lesser increases along the north shore of Lake Ontario and in Simcoe County.

The tile drainage debenture purchases for the municipalities in the northern part of the Province for the entire 1964-65 to 1971-72 period indicate that only fifteen municipalities took advantage of the program. And in most cases the average annual expenditures were quite small.

Two final tabulations illustrate the regional patterns of percentage and actual increases in the average annual values of tile drainage debenture purchases. The highest percentage increases are again associated with areas of new tile drainage activity. These areas include townships in the counties of Huron, Middlesex, Oxford, Norfolk, and Haldimand in the western part of southern Ontario; in the counties of Grey and Simcoe south of Georgian Bay; along the north shore of Lake Ontario; and in eastern Ontario. The greatest actual increases in tile drainage activity are concentrated in southwestern Ontario, with a small secondary concentration in eastern Ontario.

The series of four tables relating to tile drainage have emphasized *the absolute importance of the southwestern region*. Lesser amounts of tile drainage activity and new areas of activity included the Niagara Peninsula, the area south of Georgian Bay, the area along the north shore of Lake Ontario, and eastern Ontario.

Regional Overview of Drainage Activity, 1964-72

Considerable changes have occurred in the agricultural production of field crops in Ontario over the past two decades. These changes include increases in most crop yields and shifts in the magnitudes and regional distributions of acreages in various crops. For the most part, these changes have been related to the development of new crop varieties suited to local conditions and to the use of more intensive soil and crop practices.

In many areas, land drainage activity has no doubt been an important factor in the changing patterns of agricultural production. While a detailed provincial-scale analysis of the relationships of drainage activity to the changing patterns of agricultural production is not intended, an attempt is made to generalize the dominant trends on a regional basis.

By using the patterns of government expenditures under The Drainage Act and The Tile Drainage Act, it is possible to identify several loosely defined regions of drainage activity. For this discussion, the following seven zones or regions of drainage activity have been identified: Southwestern Ontario, Southwestern Ontario fringe, Southern Georgian Bay, Eastern Ontario, Niagara, North Shore Lake Ontario, and Northern Ontario.

The Southwestern Ontario region of drainage activity includes the counties of Essex, Kent, Lambton, and the western parts of Middlesex and Elgin. This area has traditionally dominated Ontario agricultural production, having the most significant increases in crop yields and the largest acreages in field crops, particularly shelled corn and soybeans. This area has been predominant in the patterns of drainage assistance expenditures for both consistently received the largest amounts of government drainage assistance over the 1964-72 period.

The second region of drainage activity, the Southwestern Ontario fringe, includes a broad bank of counties north and east of the Southwestern Ontario area and west of a line joining the southern part of Bruce County to Haldimand County. This zone is second only to the southwestern region in both agricultural production and drainage activity.

The patterns of field crop production in the fringe area are marked by recent substantial increases in shelled corn production, particularly in the southern counties of Elgin, Middlesex, Norfolk, Oxford, Brant, and Haldimand. Fodder corn is grown generally throughout the area, with wheat gaining importance particularly in Norfolk. Mixed grains are well established in the northern part of the zone in the counties of Perth, Huron, and Waterloo. While drainage activity has been prevalent in this area throughout the period, there have been major increases in expenditures in recent years.

The third region of drainage activity is Southern Georgian Bay and includes the counties of Bruce, Grey, Wellington, Dufferin, and Simcoe. This area experienced a considerable amount of new drainage activity during the 1964-1972 period, the magnitudes of expenditures on drainage assistance increasing significantly. During the same period, agricultural production in this area showed a significant shift away from winter wheat and into fodder corn production. While drainage expenditures in this region are not nearly as large as in the Southwestern and fringe zones, the sustained activity requires recognition.

Eastern Ontario, the fourth region of drainage activity, includes the area east of a line through Renfrew and Frontenac Counties. There has been a dramatic increase both in municipal and tile drainage expenditures in this area during the 1964-72 period. The area has experienced an increase in the production of fodder corn, with oats and hay remaining of some importance.

The fifth and six drainage regions are Niagara and

the North Shore of Lake Ontario. These zones are characterized by considerable tile drainage activity but only limited municipal drainage activity during the 1964-72 period. This may be due to the areas' topography, which has a denser network of natural water-courses that may reduce the need for municipal drainage works.

Drainage activity in Northern Ontario, the final zone, has been limited to a few local pockets including Manitoulin Island, the Lake Nipissing area, the Clay Belt areas of Timiskaming, and the Rainy River District.



Open drain under construction.



Open drain located within a road allowance.

IV. THE ENVIRONMENTAL IMPACT OF DRAINAGE WORKS

In the last decade there has been an explosion of interest in man's relationship with his environment. Greater attention has focused on some of the environmental effects of land drainage, particularly in relation to game animals and sport fisheries. Nevertheless, there is a lack of detailed scientific data on many of the potential effects of drainage.

The effects drainage has on soil properties are obviously beneficial to agricultural crops. However, areas of excess water provide a habitat for many species of plants and animals and also play a significant role in the hydrological cycle. Drainage may therefore be damaging to these nonagricultural aspects of the environment.

Constructing drains and channeling existing streams to increase the flow of water from the land surface destroys vegetation along the excavation path. Clearance of vegetation extends for a variable distance, often 30 to 40 feet at right angles to the drain, because of passes by dredging machinery and the dumping and spreading of excavated spoil. The swath of clearance along the drain or channelized stream can be particularly damaging in woodland if removing valuable timber is involved. Drainage can result in even greater destruction of natural vegetation when permanent wetlands are converted to agricultural use.

Land drainage also affects natural vegetation by altering surface and soil water levels. Drains often are installed in permanent wetlands to facilitate the drainage of adjacent agricultural land or to allow the drain to be continued to a point where adequate outlet is provided. In these circumstances, the existing vegetation may be modified considerably. Installing a drain removes areas of surface water, thus eliminating some aquatic plants. In bog areas, drainage may lower the water table, which affects the growth of various plants specifically adapted to this type of environment.

Considerable research has been conducted by forestry scientists on the effects of drainage on hardwood swamps and forested bogs. This research suggests that drainage can be beneficial in wetland forests by increasing the growth rates of a variety of tree species. Research in northern Minnesota on the effects of drainage in forested areas has revealed average increases of 100 percent in growth rates on drained areas compared with undrained sites.

Some foresters in Ontario's Ministry of Natural

Resources feel that agricultural land drainage may have a detrimental effect on woodlands. Nevertheless, the adverse effects of drainage in forested areas are not as well documented in the literature as are the beneficial effects.

Agricultural land drainage may have a variety of effects on wildlife. The most important impacts occur where various types of permanent wetlands are drained. Wetlands constitute key components of the landscape for many types of wildlife, providing cover, food resources, and breeding sites. Drainage activities may considerably influence wildlife even in areas where permanent wetlands are unaffected. In areas of intensive agriculture, open drains that have not been recently maintained contribute significantly to the total area of semi-natural vegetation. Reconstructing these drains will at least temporarily destroy the usefulness of the habitat for wildlife.

Most research on the effects of drainage on wildlife has been devoted to waterfowl and a variety of game animals because of their significance for recreation. The effect of drainage involving permanent wetlands is probably more detrimental to waterfowl than to most other types of wildlife. If the object of drainage is to convert wetland to agricultural use, the habitat is lost not only for waterfowl but also for all other types of wildlife using the area. Where wetlands are drained but not cleared for agriculture, the habitat may still be used by various types of wildlife. Removing the surface water, however, eliminates the value of the area for waterfowl and other organisms requiring an aquatic environment.

The drainage of wetlands is of major importance in its adverse effects on wildlife. In addition, the potential damage to wildlife from maintaining and reconstructing existing drains must not be overlooked. The importance of drainage ditches as wildlife habitats probably varies considerably. Ditches may be unimportant in some areas such as eastern Ontario, where there is a large variety of alternative seminatural habitats. In contrast, older drains without recent maintenance may be very significant for wildlife in the intensely farmed areas of southwestern Ontario, where alternative habitats such as woodlands and small wetlands are in short supply. In these circumstances, reconstruction or maintenance of drains will adversely affect wildlife until the vegetation cover regenerates.

Agricultural land drainage produces a variety of changes in streams and lakes. In some cases, perma-

nent stream channels are straightened and dredged to accommodate increased flows from tile and open drains. Channelization may seriously affect sport fisheries and also alters sediment loads and various other characteristics over considerable distances downstream. Maintaining and reconstructing existing drains that are not permanent streams probably results in less direct damage to fish populations because of their absence in these areas, but alterations in sediment load and water temperature may affect fish populations at other locations in the drainage network. Installing tile drains that outlet into municipal drains also alters streams and lakes by changing nutrient loads and hydrological characteristics.

It is difficult to precisely evaluate the environmental consequences of land drainage in Ontario. The survey of seven townships undertaken by the Committee's research staff forms a very small sample for assessing the province-wide situation. The smallness of the sample, however, may be mitigated somewhat because the seven townships were chosen to give coverage to all the major regions of Ontario. In addition, the sample was biased towards an overrepresentation of areas where impacts on natural vegetation and wildlife were expected to occur.

It is difficult to adequately compare the findings in these townships with other parts of the Province, because detailed research on the environmental aspects of land drainage in Ontario is almost completely absent.

Thus, there has been a tendency to discuss the environmental impacts of land drainage in Ontario on the basis of published research from the United States. If these discussions are to be valid, there must be a strong similarity between the characteristics of land drainage projects in Ontario and elsewhere in the United States.

Considerable contrasts are apparent between the characteristics of drainage projects in certain parts of the United States and in Ontario. From the analysis of drains in seven townships and discussions with a variety of individuals involved with drainage in Ontario, it is evident that most recent drainage projects have been relatively small in size. Drains are characteristically about 2 to 3 miles long, with the land acreage involved in being between 500 and 1,500 acres. There are few examples of much more ambitious drainage schemes in Ontario (for example, the Holland Marsh), but most of these date from before the Second World War. Other circumstances being equal, small drainage projects are unlikely to have the same magnitude of environmental impact as large projects. The cumulative effect of many such schemes, however, can have serious effects.

In view of the very large increases of expenditure on both municipal and tile drainage between 1967 and 1971 in Ontario, it might be expected that extensive areas of land are being drained for the first time and converted into agricultural use. Engineers' reports for approximately 140 drains in the seven townships

sampled revealed that the majority of projects involved reconstructing existing drains, although in some cases a drain was extended and new branches added. It should be pointed out that it is often difficult to judge whether a drain is new or not on the basis of existing township records. Engineers' reports frequently indicated that a drain is new when its status changes from an award drain to a petition drain. In a situation where reconstruction involves dredging an old drain that has been long neglected, the environmental consequences may differ very little from a situation where the land is first drained.

Aerial photographs from 1955 to 1971-72 were examined for the six townships sampled in southern Ontario. The disappearance of areas of permanent wetlands or woodlots as well as changes in the extent of channelized permanent streams were recorded for this 17-year period. Virtually no disappearance of permanent wetlands or woodlots was noted in West Luther and Ramsay townships, while 1 small woodlot of approximately 8 acres was cleared in Cumberland. The greatest clearance of woodland occurred in Mersea, where 27 woodlots totaling approximately 400 acres were cleared. Lesser acreages were converted to agricultural use in Ellice (120 acres) and in Brooke (100 acres). Disappearance of woodland in these townships could not be attributed solely to agricultural land drainage. Significant acreages of timber that do not require drainage are cleared in intensively farmed areas to expand the acreage of arable land. Nevertheless, approximately one half and two thirds of the woodland cleared in Mersea and Brooke, respectively, was adjacent to drains. It is therefore likely in these cases that the removal of water provided incentive to convert these acreages to intensive agricultural use.

Little increase in channelized streams was observed in any of the six townships for the period 1955 to 1971-72. In Cumberland and Brooke, a total of about 1½ miles of channel was straightened on a number of small stream sections. This channelization may have resulted from land drainage activities, though highway construction appeared to be responsible in some cases. The evidence in these six townships suggests that the loss of permanent wetlands, woodlots, and natural streams has generally been small despite the very large increase in drainage grants during the late 1960's. The greatest change has occurred in southwestern Ontario, particularly in Mersea Township, and may be explained by the high intensity of farming in this region which has provided an incentive to increase the area of agricultural land.

In eastern Ontario (Ramsay and Cumberland townships) and the Dundalk Till Plain (West Luther township), agriculture is less intensive and profitable and there is little incentive to convert wetlands and woods to agricultural use. In fact, the acreage of agricultural land has declined as marginal areas have been abandoned in recent years.

The detailed interviews concerning 37 drains in the seven townships sampled indicate some of the

consequences of drainage on the local environment. No attempt was made to investigate the large-scale regional impacts of these drainage projects on stream hydrology and wildlife outside the drain area. The interview data must be interpreted with some caution, since they involve the subjective judgements of individuals with variable knowledge of the environment. The questionnaire focused primarily on small game, fur-bearing animals, and sport fisheries. Keeping these limitations in mind, the interviews suggest that *the majority of drains analyzed had no discernible effect on the nonagricultural aspects of the local landscape*. In most cases, the numbers of small game and fur bearers, together with the level of hunting and trapping, appeared to be unaffected by drain reconstruction. Most of the drains analyzed contained insignificant fish populations and did not provide any sport fishing either before or after ditching. No evidence was found of changes in well water levels that could be attributed to the effects of drainage projects on the water table.

Adverse effects were observed in a few cases. Reconstructing one drain involved the drainage of a small 12-acre marsh, resulting in the disappearance of ducks, muskrats, raccoons, and amphibians from the site. Five or six people a year hunted duck on the marsh before it was drained. Some reduction in the numbers of muskrats and ducks was noted on other drains in the period before dredging.

In the seven townships studied, it appears that *recent drainage activity has not resulted in a major loss of natural habitats and that with a few exceptions, has not caused a major reduction in small game and fur bearing animals in the vicinity of the drain*. Caution must be exercised in transferring these conclusions to the Province as a whole. Interviews with a variety of experts, however, suggest a low rate of permanent wetland loss as a result of agricultural land drainage in the past decade. In the more urbanized areas of Ontario along the Toronto-Windsor axis, the loss of permanent wetlands through urbanization and highway construction has been much more serious than the loss through agricultural land drainage.

The views expressed regarding wetlands and wildlife are also relevant to stream channelization and sport fisheries. A small proportion of recent drainage projects has had serious adverse consequences for sport fisheries. Drain construction and stream channelization have damaged trout streams in some areas. These adverse effects are particularly serious in areas where certain types of sport fishing are in short supply. In eastern Ontario, there are very few cold water stream fisheries. The detrimental effects of drainage activities on trout streams in Norfolk County are intensified because this area contains the only cold water streams within the Lake Erie drainage basin.

The effects of drainage activity on the physical hydrology of drainage basins in Ontario has been particularly difficult to evaluate. Previous research is lacking and the Committee's research staff has been

unable to document such impacts in the present project. Several briefs presented to the Committee, however, indicated the potential serious impacts of extensive drainage activity on flood flows and low flows.

In recent years, the conservation authorities of Ontario have spent large sums of money on water management projects for flood control and low flow augmentation. These projects have included the construction of dams, reservoirs, and flood control channels. The designs of these projects are such that the hydrological characteristics of the basin must remain relatively stable for the program to achieve full effectiveness. Large numbers of drainage projects, particularly in water storage areas in the headwater sections of drainage basins, may considerably offset the efforts of the conservation authorities to provide flood protection and to guarantee reasonable levels of low flow. The Dundalk Till Plain in Grey, Dufferin, Wellington, and Simcoe counties is an example of a significant headwater region that has recently experienced considerable drain construction which may affect the Saugeen, Grand, and Nottawasaga rivers.

Drain maintenance practices should receive some consideration in assessing the present environmental effects of land drainage. As mentioned previously, the major portion of drainage grants in recent years involved reconstruction of existing drains. In most parts of the Province it has been general practice to allow drains to deteriorate over a period of years and then to undertake major reconstruction. This practice may be inefficient for adequately removing water from agricultural land, and it may reduce agricultural benefits and increase the long-term costs of municipal drains. Paradoxically, this practice probably has fewer adverse effects on the environment than most other methods of maintaining open drains. In the interval between reconstruction, which may vary from 6 to 8 years in areas of sandy soil (Norfolk County) to 15 to 20 years in heavy clay soils (Kent County), the drain habitat may be used by various types of wildlife and may provide some hunting and fishing.

A number of briefs to the Committee advocate changes in maintenance practices of drains. It has been suggested that streamlining municipal drains would enable more efficient maintenance. At present, several drains may empty into a common outlet, with a separate bylaw covering each drain. Each drain is usually overhauled separately and often at different times. If these drains were combined into one system under a single bylaw, the whole system could be dredged at the same time. Although this procedure might be more efficient from an agricultural viewpoint, it would result in a greater adverse impact on wildlife and fisheries because of the larger area involved. It has also been suggested that drains should have small-scale maintenance about every two years to remove silt from the drain and to clear aquatic and bank vegetation. It is claimed that this procedure would increase the efficiency of the drains and would considerably lengthen the time interval between massive drain reconstruction.

The views expressed on the environmental impacts of recent land drainage in Ontario must be regarded as tentative in the absence of comprehensive research.

SUMMARY

The bulk of drainage activity in the last decade has involved the reconstruction of existing drains rather than drainage of large new areas of land. Consequently, the overall provincial rate of disappearance of permanent wetlands as a result of agricultural land drainage has been relatively small during recent years. Wetland loss, however, has been considerably more rapid in a few areas, particularly in the counties to the north and west of Toronto.

The vast majority of drainage projects studied did

not appear to be seriously detrimental to natural vegetation and wildlife within the local drain area. A minority of projects, however, did have a serious effect on the environment. Moreover, the cumulative effect of a number of drainage projects, each of which has only a minor adverse effect on the environment, may be serious in some parts of the Province. This may occur especially in areas where the remaining supplies of permanent wetlands and natural streams are at a critical level.

The impact of individual drainage projects on stream hydrology is probably very small. The cumulative effect of several municipal drains and associated tile drainage systems within a drainage basin may, however, considerably influence flood peaks and other hydrological variables, as well as water quality.

V. LAND-USE CONFLICTS RESULTING FROM DRAIN CONSTRUCTION

A major concern of the Committee and of many persons throughout the Province, as evidenced in the briefs and hearings of the Committee, is land-use conflict resulting from the construction of agricultural drains. Two kinds of conflict appeared particularly prevalent — those in wetlands and those along the interfaces between rural and urban areas.

Wetlands provide a classic case of conflict in resource utilization. To the farmer, wetlands are often a nuisance that cause delays and increase costs of farm operations. They may also be regarded as areas of potentially rich unexploited agricultural land. Both viewpoints encourage wetland drainage and conversion to cropland. At the same time, undrained wetlands fulfill a wide variety of functions that are considerably significant to the public interest. A growing awareness of the variety of wetland functions has increased the conflicts arising from agricultural drainage of Ontario's wetlands.

Several approaches were adopted in researching the problems of competing land use in wetlands. First, the various types of wetland and their major functions were documented to emphasize the full range of competing land uses that can be involved. Second, the general characteristics of competing land uses in Ontario wetlands were analyzed by means of interviews with technical personnel, engineers, agricultural representatives, and others. All the briefs submitted to the Committee and the Committee hearings were also reviewed. Finally, two drainage projects involving the most common types of wetland conflict in Ontario were examined in detail. In these cases, field surveys and interviews with landowners were carried out to assess the agricultural benefits as well as the adverse effects on wetland uses.

Wetlands vary in depth, durability, and ecological characteristics. These distinctions are important because the economic feasibility of reclaiming land depends on them. Moreover, different types of wetlands have differential significance for wildlife and a variety of other functions. In Ontario, the most common terms used to describe wetlands are marsh, swamp, and bog.

A marsh is an area that is temporarily or permanently covered with water. Trees are usually absent and the main types of vegetations are grasses, sedges, and reeds.

The term swamp has been used to loosely describe all types of wetlands, but can be defined

more precisely as a wetland that supports tree vegetation. Swamps are of two types — deep and shallow. Both types support tree vegetation, but standing water persists throughout most of the summer in a deep swamp, whereas surface water is not present during the growing season in the shallow type.

The word bog is used in many different senses and sometimes includes marshes and swamps as well as true bogs. Bogs are wet areas often dominated by heath vegetation and conifers and underlain by a more or less continuous stratum of sphagnum moss.

The agricultural potential of organic soils has been recognized for many years. Draining wetlands and converting them to agricultural use has created several successful farming areas in Ontario, the most notable being the Holland Marsh, which produces millions of dollars worth of vegetables annually. However, wetland drainage has also produced agricultural failures such as the Luther Marsh in Wellington County and Tiny Marsh in Simcoe County.

In many cases, wetlands are not converted to cropland, but are drained to improve adjacent agricultural areas. Wetlands have also been drained to extract peat moss for agricultural, industrial, and home uses. This practice is currently prevalent in townships near Toronto.

Wetlands are of little importance to intensive recreation activities. Swimming, picnicking, camping, boating, and cottage living are excluded due to the unsuitability of the environment and the many mosquitoes and black flies.

Muskrat, beaver, mink, otter, and, to a considerable extent, raccoons are associated with wetlands. The majority of furs harvested in Ontario come from these animals. Several wetlands support a fur industry that is valued between 1/2 and 1 million dollars and that provides supplementary incomes for 700 persons, 20 percent of whom are farmer-trappers.

A considerable number of briefs, particularly those submitted to the Committee by nonagricultural groups, referred to wetland conflicts. However, neither the briefs nor the Committee's research made it possible to find fully documented cases of conflicts in which detailed assessments were made of the extent alternative land uses were damaged by draining wetlands for agricultural purposes.

The evidence available indicates a number of



To drain or not to drain?



Swamp as water reservoir.

wetland conflicts, although these seem to arise in only a small percentage of the total number of recent drainage projects in the Province. The extensive agricultural areas of southwestern Ontario appear to have had relatively few wetland conflicts in the last decade as would be expected for an area with a small amount of remaining wetland. However, use conflicts between waterfowl and agriculture are involved in the recent drainage of two marshes on Lake St. Clair.

Fears have been expressed regarding serious wetland conflicts on the Dundalk Till Plain in Grey, Dufferin, Wellington, and Simcoe counties. Wetlands in this region are considerably significant hydrologically since the area serves as the headwaters for the Saugeen, Grand, and Nottawasaga rivers. Several thousand acres of forest, much of it wetland, have been purchased by conservation authorities to preserve these headwater areas.

The counties to the north and west of Toronto appear to have experienced the highest rate of recent wetland disappearance in Ontario. Portions of the Stroud, Cookstown, Randall, and Adjala swamps in Simcoe County have been drained for market garden crops and sod production. Many potholes and wetlands in this region have also been drained to remove peat for commercial use.

The research staff's detailed study of seven townships and sample drains did not reveal any major example of a wetland conflict. A number of drains, particularly in West Luther, Cumberland, and Ram-

say, involved small acreages of wetland but none of these areas was converted to agriculture. There was no evidence that draining the wetlands precipitated any major disputes involving competing uses.

It was therefore decided to examine two additional drainage projects that appeared to involve major conflicts. The drains were selected to represent the two categories of conflict receiving the most attention in Ontario. One drain involved a conflict between agricultural drainage and the water storage role of wetlands, while the other involved wildlife and the recreational role of wetlands. These drainage projects were investigated to present a full assessment of all costs and benefits involved and to give an indication of how adequately The Drainage Act deals with situations of competing land use.

The first drain was about 6 miles long and included 850 acres within the drainage area. The outlet for the waters from the area was in a water-course draining through property the conservation authority had bought to preserve the natural water storage area and to develop multiple purpose forestry.

The conservation authority was concerned that the drain would have some injurious effects and made a study of the problem. The study indicated that the level of the water table would vary between 2 and 5 feet below the ground surface and that construction of the drain would lower the water table, the effect of which would extend laterally almost 200 feet. The conclusion was that this change in the water table

would not cause injury to trees but that the water holding role of the land would be damaged. As a result, the authority appealed an assessment for benefit against the properties and was successful before the county court in November 1969.

The research staff's inspection of this area indicated that there had been direct damage to the woodland during the construction of the drain, probably caused by a careless contractor and lack of supervision. Nearby landowners were interviewed but little evidence was produced of effects on the environment. Some irrigation ponds had a fall in water levels. In other areas, woodlands were drier after the drain was installed.

It may be concluded that the installation of this drain had both good and bad effects. A sample survey of the farms along the drain yielded evidence that constructing the drain significantly benefited local agriculture. Improved pastures, increased crop yields, and switches to more productive crops enabled farmers to raise more beef and dairy cattle. Benefit-cost ratios for the project were all positive based on the various factors of interest rate and years of life of the drain. This drain was clearly successful from the standpoint of agricultural production. It was somewhat detrimental to the water-holding capacity of the wetland and was neither helpful nor harmful to the woodlands.

The other drainage project studied involved the channelization of a creek that extended through the middle of a swamp. Approximately 5,200 acres were included, of which 1,600 acres were in swamp and forest. The petition was made to eliminate flooding on 100 acres of agricultural land adjacent to the swamp. The swamp was forested and ideal for ducks and marsh birds. Drain construction eliminated the flooded areas and destroyed the value of the area for fowl and marsh birds. Fur bearing animals disappeared and the importance of the area for recreation declined with the disappearance of ducks. The adverse effects of the drainage on wildlife and hunting have been substantial, and any remaining use for these purposes is likely to be seriously affected by the sales of land in 10-to-25-acre lots to potential market gardeners.

Interviews with landowners in the drainage area indicate that the agricultural benefits are still quite small. The construction of the drain, however, has attracted speculators to buy the land, clear it, and offer it in small parcels to potential market gardeners. The suitability of this land for market gardening is somewhat doubtful. Inspection of the area indicated that the depth of the black muck soil varies widely, from less than 1 foot to about 3½ feet. Muck soils should really be more than 4 feet deep before the land can be regarded as having good capability for agriculture. The environmental damage to this drainage area has been considerable. Little agricultural benefit has occurred and it is questionable whether such benefits will ever materialize.

Conflicts between owners of agricultural and urban

land have been referred to in many parts of the Province. Yet, as with the other conflicts, well-documented cases are difficult to find. One is led to suspect that such conflicts may be either very infrequent or rather unimportant. The research staff undertook three studies to investigate the problem: (1) an analysis of the briefs submitted to the Committee and of the Committee hearings; (2) a sample survey of urban properties along the drains that were analyzed in the seven townships; and (3) an investigation of an alleged rural-urban conflict on the periphery of the City of Niagara Falls.

Rural-urban conflicts are mentioned many times in the briefs and in the summaries of the Committee hearings. Nevertheless, cogent descriptions of specific cases are rare. There are many references to the "urban problem" or to the problem of "urban shadow," but a real understanding of the nature of the problem is left wanting. Major problems can be identified, however, by piecing together comments from a number of briefs or hearings, many of which overlap in their concern for a particular case.

When an agricultural drain passes entirely through farmland, particularly when all farmers derive direct benefit from the drain, the problem of determining how the costs of the drain are to be shared is minimized. But when a drain passes through a residential, commercial, or industrial area (to permit connection with an outlet downstream, for example) and provides no readily apparent benefit to the surrounding urban properties, the urban owners may resent having to pay an "unfair" portion of the construction costs. This problem appears to become serious if urban owners are aware that they are paying more than a minimal or token cost.

Agricultural landowners can also be dissatisfied in a situation of rural-urban cost sharing. In some cases, decisions were made to construct more costly drains through urban areas than through the main agricultural area that was deriving benefit. Closed drains may be required for urban areas, for example, while open ditches suffice elsewhere. Farmers complained under these circumstances because their assessments were high in order to subsidize costly construction to satisfy urban demands. There is clearly no smooth-functioning mechanism for determining rural-urban cost sharing.

Some reference in the hearings and briefs is made to physical damage occurring to agricultural drains when they pass through urban areas. The view is expressed that the urban population understands neither the function of the drains nor the need to keep them clear of garbage and other fill. In one recreation area, urban cottage owners were reported to have blocked a drain's outlet to the lake, apparently without realizing the effect on the drain's functioning (Cayuga hearing, July 23, 1973).

Many references were made to the detrimental effects of land speculation on the construction and maintenance of agricultural drains. It is argued that land speculators who own significant acreages in the

urbanizing portions of Ontario have no real long-term interest in agriculture and thus no interest in applying for drainage grants. This can stop genuine farmers in the region from getting drains constructed or maintained. Land speculators are not the only problem. Urban dwellers, in search of weekend peace and quiet, own rural acreage for horses or beef cattle but really have little interest in drainage. One case is cited where farmers could not qualify for an A.R.D.A. drainage grant because A.R.D.A. officials felt that an insufficient quantity of "genuine" agricultural land would benefit (Cornwall hearing, August 29, 1972).

A common form of urban settlement in Ontario is the string-like distribution of houses along rural roads, normally referred to as ribbon development. Although The Planning Act has deterred this form of settlement in recent years, it is common to almost every city, town, and village in the Province. Ribbon development potentially gives rise to two problems concerning agricultural drains. One relates to the possibility of nonfarmers physically abusing drains in which they have no interest, and the other to instigating procedures to undertake drain construction. With The Drainage Act emphasizing the number of property owners rather than the acreage owned some people have argued that a majority of "urban" landowners with small (for example, 1 acre) lots can stop farmers who own the overwhelming portion of the land from petitioning for drain construction with a subsidy (Cayuga, July 23, 1973). This conflict in interest is seen as a serious threat to genuine farmers who appear to be in an unfair position.

A fairly common report in the briefs and hearings concerns the pollution of drain water from urban sources, particularly septic tanks (Sarnia hearing, January 9, 1973). It was noted that the water in drains that pass through residential or industrial areas can be observed to be polluted. The implication is that the problem would not arise without the drains to spread the pollutants. A recent study by the Ministry of the Environment documents the problems in the Township of Sandwich South (1972).

Illegal hookup to drains is closely related to the problem mentioned above. Problems have arisen where urban landowners have permitted water from either storm runoff or septic systems to flow directly into drains. This can result not only in water pollution but also in overloading drain channels. Drains cannot function properly when overloading occurs and water backs up in fields.

A special case of improper hookups occurs when urban areas as a whole (a municipal government, for example) wish to use agricultural drainage channels as an outlet so they can modify the urban channel to carry an increased load. Problems can arise if rural residents see this action as a threat to the natural status of the rural landscape. There is such a case within the City of Niagara Falls.

It may be concluded that many of the rural-urban conflict problems referred to in the briefs and hearings

have a basis in fact but tend to be exaggerated or oversimplified by a lack of understanding by all parties concerned. It appears that farmers are quick to blame urban areas for having little concern for agricultural interests and that many urbanites have little understanding of the function of agricultural drains. Both urban and rural groups seem to develop unfair biases toward the other and tend to generalize rather intricate problems under the standard headings of "urban" or "rural." This situation is inevitable perhaps, but its undesirable effects can cloud the real issues and deter the fair solution of important controversies.

The seven townships and sample drains selected for detailed study were chosen to allow a good opportunity to uncover rural-urban conflicts. Care was taken to include growing towns and drains adjacent to those towns. Yet very few of the drains studied had urban properties assessed as part of the project cost, and no drain appeared to inspire any particular response — good or bad — from an urban area.

The urban properties encountered in the drain analysis were usually ribbon-type properties strung along rural roads and ranged in size from one-quarter acre to ten acres. The situations examined by the research staff failed to uncover any of the problems mentioned in the briefs to the Committee. Many of the landowners were unaware that they were located near a drain and seemed unaware that they had been assessed outlet costs. None reported any inconvenience or benefit caused by the drain. No farmers interviewed indicated any problem emanating from the urban landowners. One can only conclude that rural-urban interests in these study areas appeared to be entirely compatible.

Since the urban landowners were assessed such a small portion of the construction costs (usually only a few dollars), they were either unaware of or completely satisfied with the drain and the cost-sharing mechanism. Just as for farmers who derived no benefits from drain construction, the urban landowners who were aware of the situation appeared to accept their share of assisting those who wanted the drain construction to go ahead.

Three general conclusions concerning land-use conflicts are thus apparent:

1. Although land-use conflicts concerning wetlands and rural problems can be documented and are of real concern to responsible citizens, the Committee's research suggests that genuine conflict situations are rather rare. In the vast majority of cases, the construction of recent agricultural drains has led to no serious conflicts in land use.

2. Although problems of competing land use in the urban fringe and in wetlands have been singled out for study, it should be noted that drainage projects affecting permanent streams constitute another category of drains that involve land use conflicts and problems of public versus private interests. Several conflicts arising from the adverse effects of drains on

sport fisheries have been reported in recent years, particularly in Norfolk, Grey, and Bruce counties.

3. In areas of genuine land-use conflict, current procedures for obtaining drain construction approval have not been adequate to deal with the problem. This applies primarily to The Drainage Act but also to other acts (The Municipal Act, for example), that have some concern with drains in conflict areas.

The following sections examine three possible means of helping to resolve potential land-use conflicts.

Benefit-Cost Analysis Prior to Drain Construction.

Benefit-cost analysis can provide a logical framework for evaluating a course of action, and has been used extensively in the resource management field. The general procedure is to place a precise quantitative economic value on all benefits and costs associated with a project. Decisions concerning the advisability of the project are then made on the basis of the values of the benefit-cost ratios.

Problems arise in the use of this technique in Ontario, except possibly for drainage schemes much larger than the norm or for special rural-urban drains. Many of the values associated with environmental impacts (for example, in wetlands) are intangible and cannot be measured readily in monetary terms. Some procedures are available for attaching quantitative values to the recreational role of wetlands, but this only measures the value of one of the many functions

of a wetland. No practical means are currently available for measuring the economic value of the hydrological, pollution-filter, aesthetic, or other functions.

Land-Use Planning. A number of briefs presented to the Committee suggested that problems of competing land uses that involve environmental impacts could be resolved by zoning the landscape into various categories.

Category 1: areas where drainage should be facilitated because of high agricultural benefits and a minimum of land-use conflicts.

Category 2: areas where drainage should be prohibited because of the likelihood of environmental damage.

Category 3: areas where the situation is less clear-cut and considerable study would be required on each project before drainage could be allowed to proceed.

The type of land-use planning advocated in some cases appears to involve micro-scale zoning. For example, Category 1 would include most productive agricultural areas in the Province. Another concept suggests the use of the three types of category at a micro-scale involving the mapping of small drainage basins which could ultimately be fitted together to form a master plan for an entire major watershed.

The Committee's study of land drainage suggests



Installation of a structural-plate, pipe-arch farm bridge.

that land-use zoning on a micro-scale would not be particularly helpful in resolving conflicts. The wide variation in agricultural benefits among individual drains even within a single township indicates that it is unrealistic to identify large regions of the Province where drainage should be facilitated because of the agricultural benefits. Prohibiting drainage in certain parts of eastern Ontario would certainly prevent constructing some drains that produce considerable agricultural benefits. Conversely, automatically approving all projects in southwestern Ontario might result in the disappearance of the last remnants of wetland, which may be of major ecological importance by virtue of their very scarcity.

The detailed land-use zoning involved in the micro-scale drainage basin approach appears to be more realistic for judging the advisability of land drainage projects. The amount of work needed to evolve this type of detailed zoning, however, appears to be considerable and may only be justified in areas of intensive land drainage activity.

Formulation of Land-Use Priorities. A severe problem that is evident in almost all cases of conflict is the lack of clearly defined land-use priorities at the local or provincial levels. With respect to wetlands, for example, there are no guidelines to indicate the general amounts of wetland that should be preserved for hydrological, recreational, or aesthetic purposes. Neither all wetland needs to be preserved nor all destroyed. Determining wetland needs for hydrological purposes requires much more scientific research. Needs for recreation and other purposes presumably also require extensive surveys of current and potential users. Yet certain general guidelines could be determined which could be useful for resolving conflict situations. It might be determined, for example, that a limit should be placed on the reduction in wetland within broad regions to ensure the availability of a minimum of wetland. Obviously, general guidelines such as this would be most effective if determined through the joint cooperation of concerned governmental and other agencies. The task of formulating general rural land-use policy is not insurmountable, and should greatly assist the resolution of conflict situations.

VI. COSTS AND AGRICULTURAL BENEFITS

With the Committee's assistance and guidance, the research staff selected seven townships across Ontario for detailed study. These seven townships represented a broad variety of conditions, and a file was compiled for each containing data on physical background, settlement, agricultural production, artificial drainage, aerial photograph mosaics, and special reports.

Only drains constructed or modified during the period from 1965-66 to 1969-70 were included in the study. All drains were listed and a random sample of 4 drains was selected for each year, yielding 20 drains per township for the five-year period. These drains were mapped and 5 for each township were selected for study to ensure that a wide variety of conditions was represented. In two townships, 6 drains were examined to permit an even broader range of conditions.

Having determined the drains to be studied, the staff formally selected sample properties. About 40 properties were studied in each township, averaging 8 properties per drain. The number of property owners interviewed was sometimes less than the number of properties since individuals often owned more than one of the sample properties. Everywhere farmers were willing to arrange for long and detailed interviews. The staff was satisfied that the farmer survey proceeded successfully.

The primary objective of the interviews was to determine the benefit-cost ratios for all drains. This ratio was obtained by dividing the total cost of the drain (irrespective of subsidies) into the present value of all current and future net returns from agriculture that would not have occurred without the drain construction to yield the benefit-cost ratio. Ratios with values of less than 1.0 would indicate that the benefits are outweighed by the costs; those with values of 1.0 reflect that benefits are equaled by costs; and those with values of greater than 1.0 indicate that benefits outweighed the costs. It normally is hoped that ratio values will exceed 1.0.

The present value of current and future benefits (the numerator of the benefit-cost ratio) was calculated by determining the average annual net increase in agricultural income and adding together the present value of all such annual net increases over the time period for which the benefits are expected. The formula for calculating the present value of the net increases in future annual income is

$$V = \frac{A}{(1-i)^n}$$
, where V = the present value of the
annual net increase in future income, A = the average

net increase in annual income, i = an appropriate interest or discount rate, and n = the number of years into the future of the net increase in income.

The calculations for this study were based on several assumptions:

1. Only agricultural benefits are considered; any benefits accruing to roads or other land uses are ignored.

2. The future annual incomes due to drain construction will remain the same as those reported for the present. Even though considerable yearly variation is bound to occur because of varying weather conditions and even though the increases reported to date may be abnormal, it is assumed that future increases will not differ from current ones.

3. The increases in production due to drain construction will cease at the end of the drain's life cycle (that is, when it becomes defective). For simplicity, this study assumes that the increases remain constant throughout the life of the drain until it becomes defective.

4. An appropriate range of interest rates is 6-10 per cent, and would seem to span the rates at which the government is able to borrow money.

5. An appropriate range of lifetimes for the drains is 5-20 years. Estimates of lifetimes were obtained from public reports prepared by a number of drainage engineers.

6. No secondary benefits to sectors of the economy related to agriculture are considered. For example, increased purchases of farm inputs are not counted as benefits accruing to the project.

Under these assumptions, present values and corresponding benefit-cost ratios were calculated separately for interest rates of 6, 8, and 10 per cent and for drain lifetimes of 5, 12, and 20 years. This range of values permitted a proper evaluation of any drain in the sample.

Construction costs for the sample properties on the drain were based on the actual total cost of the drain and the engineer's estimate (in the engineer's report) of the proportion of that cost that should be paid by those properties. The samples normally included three times as many benefit properties as those assessed only for outlet. So the outlet properties, which almost always report no increases in production, are underrepresented, possibly leading to unrealistically high benefit-cost ratios. On the other

hand, outlet assessments on the sample properties were small and almost insignificant compared with benefit assessments. Considering this is the case and that the engineer distributes assessments under a system bearing a strong relationship to probable benefits, the cost figures and corresponding benefit-cost ratios in this study are fair and appropriate. In some cases, calculations of this type were unnecessary since the sample included all properties subject to benefit assessment.

Increases in farm income due to drain construction are sometimes difficult to distinguish from those accruing to other factors, such as changes in seed or equipment. Even though the questionnaire provided for this distinction, the data still contain many uncertainties. In calculating increased benefits, the average annual value of drainage-related increases in production was determined whether or not the increased production was actually sold. Specific data on production changes and general estimates of the percentage of net income change, which could be cross referenced with calculated changes, were obtained.

Production increases tended to result from increases in yield, changes in land use, changes in rotation systems which permitted more lucrative crops to be grown more often, or changes in animal production. Another form of change that was included in the calculation of net income changes was the value of human labour saved when less time was required for farm work. Associated with the changes in gross income were a number of changes in costs. Besides paying for the drain, several other input costs were incurred, including the cost of new equipment, fertilizer, and livestock.

A significant added cost occurred when field underdrainage was installed to take advantage of a new outlet drain. This presented a serious accounting problem, since the life of field underdrainage systems tends to be much longer than that of outlet drains. Consequently, the cost of field underdrainage was calculated on the basis of the yearly payment required to cover the total installation cost over 40 years at 6-per cent interest. The 6-per cent interest rate was chosen because it is midway between normal bank-loan rates and the special 4-per cent rate normally obtainable through The Tile Drainage Act. The 40-year period was chosen because it approximates many estimates of the effective life of field underdrainage. A shorter period such as the lifetime of the outlet drain was not chosen since this would suppose that all benefits from field drainage terminated before the end of the actual underdrain lifetime. It is recognized that farmers do pay for field underdrainage in a shorter period than 40 years, so that their annual costs would be somewhat higher than those used in this analysis. This study thus assumes higher incomes during the first few years following a project and lower incomes during later years than farmers would probably experience.

Prices and costs used in calculating increased net income were county averages for 1969-72 (from

Ontario Statistics, Ontario Ministry of Agriculture and Food, 1969-72.) Prices for items not included in the usual publications were obtained directly from the Ministry of Agriculture and Food or from marketing boards.

The following example helps illustrate the way values for increases in income were derived. Since the completion of the drainage works, most of the farmers interviewed reported little change in production. One farmer, however, had installed new tile under 20 acres at a total cost of \$3,420. The annual equivalent of this cost as calculated by the above procedure is \$227. Some change in land use and yield occurred on the sample properties, but most of the change was on the newly tiled land where former pasture had been switched to grain. The difference in the market value of current over past production was calculated separately for each farm in the sample and summed to yield a net increase of \$2,703, most of which occurred on the farm with the newly tiled land. Where changes in crop rotation were involved, annual production values averaged over three or four years or the length of the rotations to derive increases in the value of average gross annual production.

Increased production required increased costs in addition to the cost of field underdrainage. Culverts were installed, a granary constructed, and more fertilizer purchased. The annual value of these added costs was \$392, calculated by spreading the costs over the life of each item at 6-percent interest. Thus the average annual increase in *net* income, irrespective of labour costs, is $\$2,703 - (\$392 + \$227) = \$2,084$. Less labour has been required following the project's completion, with farmers reporting an aggregate saving of four days. At \$20.00 per day for labour, the value of the saving is calculated at \$80.00. Thus, the final estimate of the average annual increase in net income is $\$2,084 + \$80 = \$2,164$.

Significant differences can occur between the actual change in income experienced by farmers and the calculated estimates. If the labour saved is the farmer's own time, for example, he will gain no financial return. Also, the cost of the tile might be borne in 5 years rather than 40. The Committee's research staff believes, however, that the procedures used are essential to produce comprehensive estimates of the full benefits and costs over the life of the drains, even if the statistics differ from particular farmers' experiences in the short run. In fact, in many cases the estimated benefits closely resemble those reported by property owners.

The generally assumed agricultural benefits of draining land are evident through the study areas. Most property owners interviewed (195 out of 232) felt that drainage was beneficial, and the production data and benefit-cost ratios tend to confirm this feeling. Of those interviewed, 107 felt that outlet drainage installations had led to increases in crop yields, and 179 indicated their willingness to pay for drain maintenance whenever it is required. In addition, 122 prop-

Table 1 — Average Benefit-Cost Ratios in Sample Drains

Area	No. of drains	5-yr. life calculated at:			12-yr. life calculated at:			20-yr. life calculated at:		
		6%	8%	10%	6%	8%	10%	6%	8%	10%
S.W. Ont.										
Twp. A.	6	1.19	1.13	1.07	2.37	2.13	1.92	3.24	2.77	2.40
Twp. B.	5	1.82	1.73	1.64	3.63	3.26	2.95	4.96	4.25	3.68
N. Ont.	5	.53	.50	.47	1.05	.94	.85	1.44	1.23	1.07
E. Ont.										
Twp. A.	5	.27	.26	.25	.54	.49	.44	.74	.64	.55
Twp. B.	5	1.01	.95	.91	2.00	1.80	1.63	2.74	2.35	2.03
Fringe ^{a/}										
Twp. A.	6	3.00	2.84	2.70	5.95	5.37	4.85	8.17	6.99	6.06
Twp. B.	5	.48	.45	.43	.95	.86	.78	1.30	1.12	.97
TOTAL	37									

^{a/} Fringe identifies drains in townships in the area just east of the extreme southwest counties (e.g., Middlesex, Huron, Bruce).

erty owners indicated that they would have supported the project without the government subsidy.

Beyond the general positive evidence of the impacts of drainage, considerable intertownship and interdrain variation was revealed. The highest benefit-cost ratios occur in the traditional locations of high agricultural productivity. Thus southwestern Ontario would appear to benefit significantly more than other parts of the Province. On the other hand, drains in some of the frontier drainage areas barely if at all pay for themselves. It is inappropriate, however, to assume that all drains in one region are beneficial and all those in another are not, because significant variation is evident among drains in individual townships. Measuring benefits in areas like southwestern Ontario where drainage has a long history and where most of the recent work involves reconstruction, is difficult because improvements may not only yield higher production but may also prevent future declines in production should existing drains become defective. The real benefit from regular maintenance would be the prevention of future production declines when the drain did become defective. In actuality, maintenance apparently is postponed until production problems are evident.

Northern Ontario drains (Table 1) are much more recent in construction and show great variation in benefit-cost ratios. Two of the drains have led to very small increases in income and to benefit-cost ratios so low that the construction costs will not be recovered. Two other drains have ratios with values of about 1.5 (12-year lifetime) and another has much higher ratios.

Benefit-cost ratios in eastern Ontario are generally low and only two of the drains studied are likely to pay for themselves (Table 1). Farms along two other drains in this area have experienced no benefits at all. In one area, two drains have very high ratios, even

though two others will not come close to paying off unless current responses to the drains change radically.

One township in the fringe area contains drains with the highest benefit-cost ratios of any studied (Table 1). Conversion of acreages from hay and small grains to corn and soybeans seems to have helped produce the highly beneficial perspective. The ratios in another township in the fringe vary considerably, ranging from three drains with little beneficial response to two others where drainage construction has obviously been a wise economic investment.

It must be emphasized again that the data used in this analysis are mostly estimates of questionable accuracy. The calculations are based on very specific and limiting assumptions that must be fully appreciated prior to interpretation. Nevertheless, it is felt that the data and the derivations are valuable and can reflect a good assessment of benefits and costs when used with caution.

On the whole, the general response in agricultural production justifies the construction of outlet drainage in the sample areas. This trend varies considerably, however, between townships and drains. Many of the sample drains, particularly in eastern and northern Ontario, have benefit-cost ratios with values below 1.0 and have been beneficial to property owners only because of government grants. Great variation in agricultural response is noted even among the properties along a single drain. A drain can quite normally have a good benefit-cost ratio because of very high responses on a small minority of farms even though the majority of properties have no increases in production.

The following sections discuss seven major factors that account for the variation among drains in benefit-cost ratios.



Good ditches make good crops.



Trenching machine installing 24" diameter tile.

1. Productivity of the Environment

The agricultural productivity of the environment varies considerably across Ontario due primarily to differences in soil and climatic conditions. Southwestern Ontario's unique combination of good soils and a long growing season gives it an environment superior to the rest of the Province. Since drainage construction costs are similar across the Province, funds invested in drainage in southwestern Ontario are bound to yield greater agricultural productivity than in other regions. Investments in eastern and northern Ontario, with their limited soil and climatic conditions, would be expected to yield lower returns. This basic relationship, which tends to accentuate the comparative advantage of "privileged" regions for capital invest-

ments, undoubtedly accounts for the general tendency of southwestern Ontario to have higher benefit-cost ratios than other parts of the Province.

On a more local scale, investment in drainage can lead to spectacular benefits if it permits switches to more lucrative land uses besides improving yields of existing ones. Such investments lead to critical changes in the productive environment which can be accompanied by very high benefit-cost ratios. In the sample areas, the highest benefit-cost ratios tended to occur where drainage permitted land to switch from hay or small grains to corn or soybeans. One township particularly contained a number of sample properties where drainage permitted this critical switch — a switch that tended to occur farther southwest several years ago.

2. Installation of Field Underdrainage

A 1972 report to A.R.D.A. concerning agricultural land drainage in eastern Ontario pointed out that when new outlet drains are installed, beneficial responses only occur on a large scale if field underdrainage is installed and attached to the outlet. This study confirms that conclusion. Drains with high benefit-cost ratios tend to be those where field underdrainage had been installed before or after the outlet project. Where field drainage was not installed, particularly in eastern and northern Ontario, benefit-cost ratios were unfavourable.

3. Special Hydrological Conditions

Outlet drains are often of some benefit to farms even without field underdrainage, but this is largely dependent on local hydrology. The benefits are usually very few, but under unusual circumstances outlet drainage alone can lead to benefit-cost ratios with values over 1.0. A new drain in northern Ontario, for example, prevents the flooding of fields by runoff from surrounding higher ground.

4. Local Initiative

Obviously important to the success of a drain is the initiative local farmers take to utilize its potential benefits. Such initiative might include installing field underdrainage. There was great variation in the degree of local initiative, providing an important reason for the variation in benefit-cost ratios. The most successful drains tended to be of fairly modest cost (\$2,000-\$4,000) and with a relatively small number of farmers having a genuine interest in the project. On the larger projects, two or three farmers commonly experienced all of the benefits, leaving the majority of landowners with no changes. This is why many of the farmers on large drains reported little benefit even though the overall benefit-cost ratios had values well in excess of 1.0.

5. Type of Project

The type of drainage project has an important influence on benefit-cost ratios. This is particularly true for maintenance projects, where the most important benefits may be unmeasurable (as in the prevention of future production decreases).

6. Quality of Engineering

The engineer who designs a drain can have a profound effect on the benefit-cost ratios. Some drains, for example, appear to be much too elaborate and costly for their intended purpose, thus lowering the benefit-cost ratios.

7. Weather Conditions Since Project

It has been pointed out that the ultimate effects of some drains could not be measured yet, since the years following construction had had abnormal weather conditions. In eastern Ontario, particularly, abnormally heavy rainfall has not permitted realization of the full beneficial effects of new drains.

It is important to note that the first six of these seven factors affecting benefit-cost ratios can be evaluated, estimated, or controlled *before any drain is*

constructed. It therefore should be possible to produce fairly good estimates of the benefits to be expected from drain construction, perhaps before an engineer's report is completed and certainly with expanded versions of the reports.

But it should be clearly understood that the considerations and techniques used in calculating benefits should be the economic benefits accruing as a result of the construction of a drainage works and not the benefit as assessed by the engineer. The latter is a calculation usually pro-rated down to provide for the payment by ratepayers of the cost of the drain in proper proportion to their total benefits. In some cases, also the benefit assessment may not reflect the total benefit to be derived. Lands where improved drainage is provided, are assessed their share of the outlet costs and these could conceivably be greater than the benefit assessments.

VII. AN EXAMINATION OF DRAINAGE COSTS

The Committee authorized an engineering firm with extensive practise in land drainage to undertake a study of drainage costs. This project included an investigation of the factors influencing these costs and how they may best be controlled or possibly reduced. Existing records were examined to establish a statistical profile of past and present drainage work in Ontario with emphasis on the effect of implementing and removing grants in the last ten years. This information was obtained chiefly from the files of the consultant, which covered a period of some 60 years and was supplemented by interviews with individuals knowledgeable of drainage costs. The actual study was limited to the period between 1940 and 1972, reviewing a reasonable mixture of new drains and drains that were being repaired or improved. Although the report dealt primarily with municipal drains, the costs concerned with private drainage schemes were reviewed to some extent in that section of the consultant's report dealing with covered municipal drains.

To illustrate the changes in the costs of drainage works, three drainage cost indicators were selected:

1. Construction costs per cubic yard of earth moved;
2. Total project costs per 100 feet of drain; and
3. Total project costs per acre drained.

The cost per cubic yard included the costs of removing timber, installing culvert pipes, leveling excavated material, and all other work generally required of the drainage contractor. This did not include material costs such as culvert pipe and concrete installations. The cost per 100 feet of drain was taken to be the entire cost of the drain divided by the number of hundreds of feet in the drain on which work was carried out. The cost per acre of land drained was taken to be the entire cost of the drain divided by the number of acres within the watershed.

The cost indicators were then averaged out to produce a typical cost for each five-year period from 1940 to 1965. Further costs were calculated up to 1972, with particular emphasis on the period 1965 to 1967 when the effects of the two-thirds grants were becoming evident in the study area. The dollar costs for each indicator were then converted to a cost index (1940 = 100). The three indices are shown in Figure 2. The mean of the three cost indicators was then calculated at the end of each five-year interval and is shown as the Cost of Drainage Index on Figure 2.

The Cost of Drainage Index relates only to open

drains and is based on data collected in southwestern Ontario. It was felt that if the same information were collected from a different set of drains in a different area, the numbers would have been somewhat different but the trends would be reasonably consistent over the whole Province.

Information was then gathered on the farm price indicators that represent trends in the farm economy. These are:

- Farm operating expenses;
- Yield per acre of principal field crops; and
- Gross receipts from the sale of farm products.

Information on these indicators was obtained from *Agricultural Statistics for Ontario* and converted to an index for each indicator. These indices are shown in Figure 3 with the Cost of Drainage Index.

Three other indicators that are representative of prices and costs in Canada were examined. These were:

- Consumer Price Index;
- Average hourly earnings in construction in Canada; and
- The Engineering News Record Cost Index.

These economic indicators are shown in Figure 4 with the Cost of Drainage Index.

Figure 2 illustrates a relatively slow rate of increase between 1940 and 1965, a sharp increase between 1965 and 1967, and a lesser but still significant rate of increase between 1967 and 1972. This is an excellent illustration of the effect on costs resulting from a major increase in the grant structure.

Figure 3 shows the relatively steady increase in the farm price indicators, which remained above the cost of drainage until the period when the A.R.D.A. grants were introduced. Since that time, the cost of drainage has increased somewhat faster than the farm price indicators.

Figure 4 indicates that the cost of drainage between 1940 and 1965 ran somewhat below the other construction indices, although the substantial gain in the Cost of Drainage Index between 1965 and 1967 was almost enough to catch up with the other indices. The Consumer Price Index did not reflect the substantial increases in the construction indices.

To evaluate drainage costs, it was appropriate to break down the chief cost components, which include materials, contractors' charges, allowances, and overhead costs. The changes in the component costs were examined from 1940 to 1973.

Materials relate to culvert pipes of either concrete or steel in the case of open drains and to agricultural tile, pipe, or precast appurtenances in the case of covered drains. The increase in material costs can best be illustrated by 4-inch clay tile which was 3 cents a foot in 1940 and about 11 to 12 cents a foot in 1972. The increase in material costs has very closely followed the rise in the Consumer Price Index. It should be noted that the present (May 1974) price for 4-inch clay tile is approximately 16 cents a foot.

In the case of open ditches, the contractor's charges generally include excavating and leveling the material, removing timber and debris, and placing and backfilling culverts. In the case of tile drains, the charges in municipal drainage activity include excavating the trench and laying the tile and generally spreading the tile and backfilling the trench. In private drainage activity, the farmer often takes care of the latter two items. Figure 2 illustrates the trends in this component. It is interesting to note that the cost per cubic yard, which is probably the least labor intensive of the drainage cost indicators, has tended to lag behind the others.

The allowances relate to damages caused by the disposal of excavated material to the land occupied for drainage purposes, to severance of land resulting from the location of the drain, and to compensation to lands adversely affected by not taking a drain to a sufficient outlet. Allowances for damages have tended to increase in relation to increased value in crop yields. Since the damage is related to the area covered, the thinner spreading of excavated material in recent years has increased the area affected, resulting in higher allowances. Allowances for lands, which are related to going land values, have exhibited a steady increase. Allowances for severance, which are related either to the value of the land severed or to the cost of a bridge or culvert which could be installed to permit access to that land, have undoubtedly tended to increase, although no pattern was established. Compensation in lieu of taking a drain to a sufficient outlet has been used rarely, so that allowances could not be correlated.

Overhead costs are composed of engineering fees, incidental to the preparation of the report, administration (clerk's fees and preparation of by-laws), and the supervision of construction. All these are labor intensive items and as such have shown a steady increase. As a percentage of the total cost of the drainage works in the area under study, the changes have not been great, with supervision and administration remaining almost constant and engineering fees tending to increase. This increase is due to greater sophistication in the drainage schemes, which tends to increase the preengineering workload. Supervision is generally carried out partly by the

engineer and partly by the drainage commissioner, who may be a council member. In some cases, supervision is almost entirely carried out by the engineer, which naturally increases the cost.

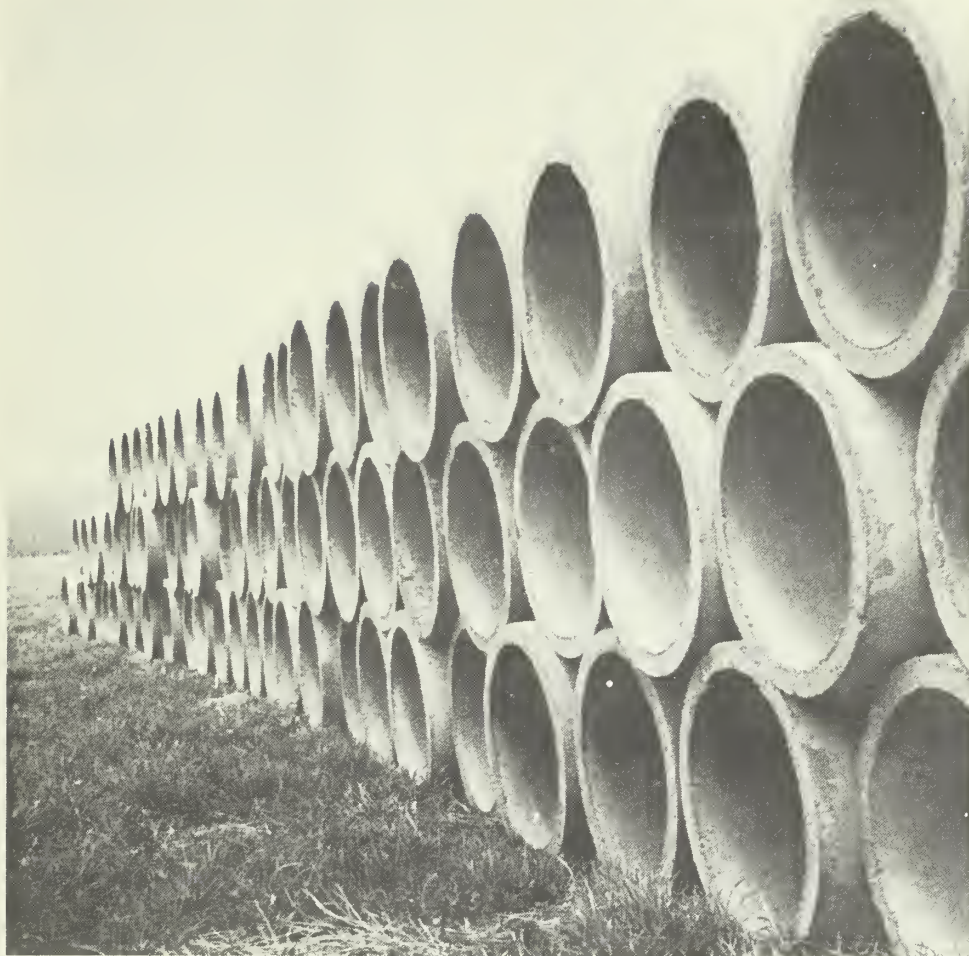
Consideration was given to the factors that influence changes in drainage costs. Materials, being manufactured items, tend to rise at about the same rate as the Consumer Price Index — a trend that may be expected to continue.

If a contractor is to continue in business, his basic charges obviously must be sufficient to cover the cost of wages for his operator and crew and to pay both the operating and capital costs of his equipment, together with something for overhead and profit. Beyond this, the amount that the contractor charges will depend on the degree of competition for work in the area. The demand for drainage work varies with the weather, the level of the farm economy, and the price of farm crops, along with the availability of grants. Increased grants lower the cost to the farmer, thus increasing the demand. However, the sharp increase in costs when the A.R.D.A. grants were available illustrates the measure to be somewhat self defeating. Although the degree to which the grants influenced drainage costs varied both by region and by type of drain, their effect was a significant factor for the Province as a whole.

There is continuing pressure to increase the allowances for damages to lands and crops. As mentioned, the tendency now is to spread excavated material to about 6 inches as opposed to 12 to 18 inches in the past. As crop yields improve and farm commodity prices increase, the crop loss will be higher. Engineers are becoming more conscious of these facts, which has been reflected in the allowances. Land allowances are generally related to the prices paid for lands by the road authorities who are acquiring land for highway purposes. Therefore any changes in county or township policies have an immediate effect on these allowances. Naturally, the changes always involve increases. The severance allowances tend to increase as time passes because of increased land values and increased bridge construction costs.

The consultant did not document any specific case where allowances were artificially excessive to help offset assessments. However, the Committee is aware of instances when pressures were put on engineers to increase allowances for this purpose. The Committee is also aware of instances where the magnitude of the allowances for damages and right of way cannot be reasonably justified. One of the problems with allowances is that decisions on damages must be made before the fact. Since the engineer cannot be sure when the work will be done, he must often assume the worst and base his allowances on the work being done at a time and in a manner such that crops are actually lost. This also applies to the allowances made for land occupation, but probably to a lesser degree.

The overhead costs, of which the largest portion is



Closed drains with tiles like this (24" x 4") are costly installations.

usually engineering, tend to increase. Engineering increases are generally related to increased wages and also to increased demands on the engineer's time for implementing more sophisticated drainage schemes which involve pipelines and other utility services that must be located and satisfactorily handled. Farm owners have become knowledgeable and require more detailed information from the engineer than in the past. The engineer is expected to attend the reading of the report in most cases, and often the court of revision. The engineering time spent on a drain today is estimated to be 50 to 60 percent greater than the time required on the same drain for basically the same work 25 years ago. Since most engineering firms base their fees on the time and related expenditures, the cost must necessarily go up.

The principal costs of administration are also labor intensive, with the cost being influenced directly by the wages and salaries paid to those people responsible for preparing the copies of the by-law and carrying out the duties of the clerk. Most municipal clerks are now full-time employees and, because the level of knowledge required is greater than in the past, salaries have risen at a somewhat greater than normal rate. However, this is sometimes offset to an

extent by the office help now available to them. Printing and mailing costs have increased, and both recent revisions to The Drainage Act and requirements of the Ministry of Agriculture and Food with respect to grants have tended to increase workloads. Within the area studied, the increases in costs of administration of drainage schemes apparently have been matched by the increases in the overall costs since the percentage of these costs to the total costs has remained almost constant for the last 32 years.

The cost of supervision also depends directly on the amount of time spent and the salaries paid to those providing the services. The trend has been towards more supervision as the drainage schemes become more complex, which is entirely justifiable. Where the engineer bears the major responsibility for supervision, the costs tend to be higher than where a drainage commissioner undertakes the day-to-day supervision. The pay rates of the commissioner may be expected to be less than the engineer's. If they are higher than those of the engineer's assistants, the profit margin and the time involved in traveling to and from the job will likely offset any savings.

The type and size of drain has a profound effect

on the cost of the work. Obviously, a long drain is more expensive than a short one and a drain with a large carrying capacity costs more than one with a small capacity. These factors are directly related to the size of the watershed and the amount of runoff from it. Thus the only control on this aspect of a drainage works depends on the engineer's judgment in determining the rate at which runoff must be handled. In locations such as pasture or bush, short-period flooding does not create any problems, while in places such as tobacco farms, flooding the crop for even a few hours can be disastrous.

The engineer must make the basic decision of whether to construct an open ditch or a closed drain. Small watersheds are generally best and most economically served by a covered drain. As the size of the watershed increases, however, a covered drain generally becomes a great deal more expensive than an open channel. Often, the owners involved feel the advantages of the covered drain for efficiency of operations may justify the premium that must be paid for such a system. The availability of grants frequently has a bearing on the choice of drain type as was readily apparent when A.R.D.A. grants started in 1966. When the grants ended in 1969, the number of large covered drains being installed annually dropped considerably.

The total cost of a drainage project is influenced greatly by additional work or material that is provided over and above actually excavating the channel or laying the tile. Perhaps the most notable item in this regard is bridge or culvert construction. In the early 1940's timber bridges were common and served their purpose, considering the loadings and nature of use. Today, corrugated steel and sometimes concrete structures with greatly increased loading and width requirements must be installed. For example, an 8-foot-span wooden bridge that was built in 1936 at a cost of \$100 was replaced in 1969 by a corrugated steel pipe arch at a cost of \$1,000. More attention is being paid to erosion control, which can be costly in many instances. Catchbasins and other covered drain appurtenances are in greater use, the cost of which has increased 5 to 6 times in the last 25 years.

The availability of grants from 1966 to 1968 also affected the number and cost of these additional items, especially bridges and culverts. The sharp rise in the indices for the cost per 100 linear feet of drain and the cost per acre drained that occurred between 1965 and 1967 (Figure 2) largely resulted from including these additional items in the drainage projects.

Changes in the pattern of owner involvement has had an influence on the cost of the drainage works. Maintenance and repairs to municipal drains were at one time often undertaken by the owners involved, thus reducing the scope and frequency of major repairs. At present, owners are either unable or disinclined to assume these responsibilities and the cost of maintenance and repairs has increased. Traditionally, the farm owner worked side by side with the

contractor when private tile systems were being installed. Because many owners now operate large holdings or have other interests, they do not have time to assist, which can only add to the out-of-pocket costs of installing tile drainage.

Special problems arise whenever a drain has to cross a road or a utility. Crossing recently paved roads must be effected by jacking or boring methods for covered drains and by similarly sophisticated means for open channels. This naturally increases costs. Similar procedures must be followed for crossing a railway. These operations generally require permits and other expenses such as increased supervision. Utilities such as gas or water lines also involve special construction procedures as well as related overhead costs. All these costs are generally borne by the authority involved, but must be considered in the overall cost of the drainage scheme.

In considering the preceding discussions, it is fairly clear that by far the great part of the increase in drainage costs is tied directly to the general increase in the Consumer Price Index and more particularly to increase in construction costs (Figure 4). A reversal of the trends in construction costs seems remote, although some things might be done to help slow the rate of increase.

Timing and combining of projects to allow volume purchasing can affect the costs of materials. In most cases, however, this would be difficult to organize, and if all material orders were moved to the winter months, seasonal discounts would simply shift to the summer.

The best way to hold down contractors' charges is to ensure a reasonable degree of competition. Because of the variety of uncontrollable factors that affect the number of drainage projects to be carried out (weather conditions and farm economics, for example), it seems almost impossible to set up a program to ensure a match between the contractors and the work. It has been suggested that municipalities purchase equipment and carry out their own drainage work, but indications in the foreseeable future are that contractors will be better able to provide this service than government. Because of the incentive aspect, it is reasonably certain that contractors will avail themselves of new developments and equipment as they become available.

Land and crop damage can be kept down if drain work is done either before the crops are planted in the spring or after they are harvested in the fall. Every effort usually is made to do this. Trucking excavated material away could be considered although trucking costs make this impractical except in the case of very high value crops. Allowances for land occupied by a drainage works must relate to current market value and will not be decreasing. One possible solution is to reduce damages and the area occupied by the drainage works by constructing covered drains. In most instances, however the additional costs involved are almost certain to offset the savings. To achieve

Figure 2

Drainage cost index for open drains

Legend

- Cost per 100 L.F.
- Cost per cubic yard
- Cost per acre drained
- "Cost of drainage"



Figure 3
Farm Price Indicators

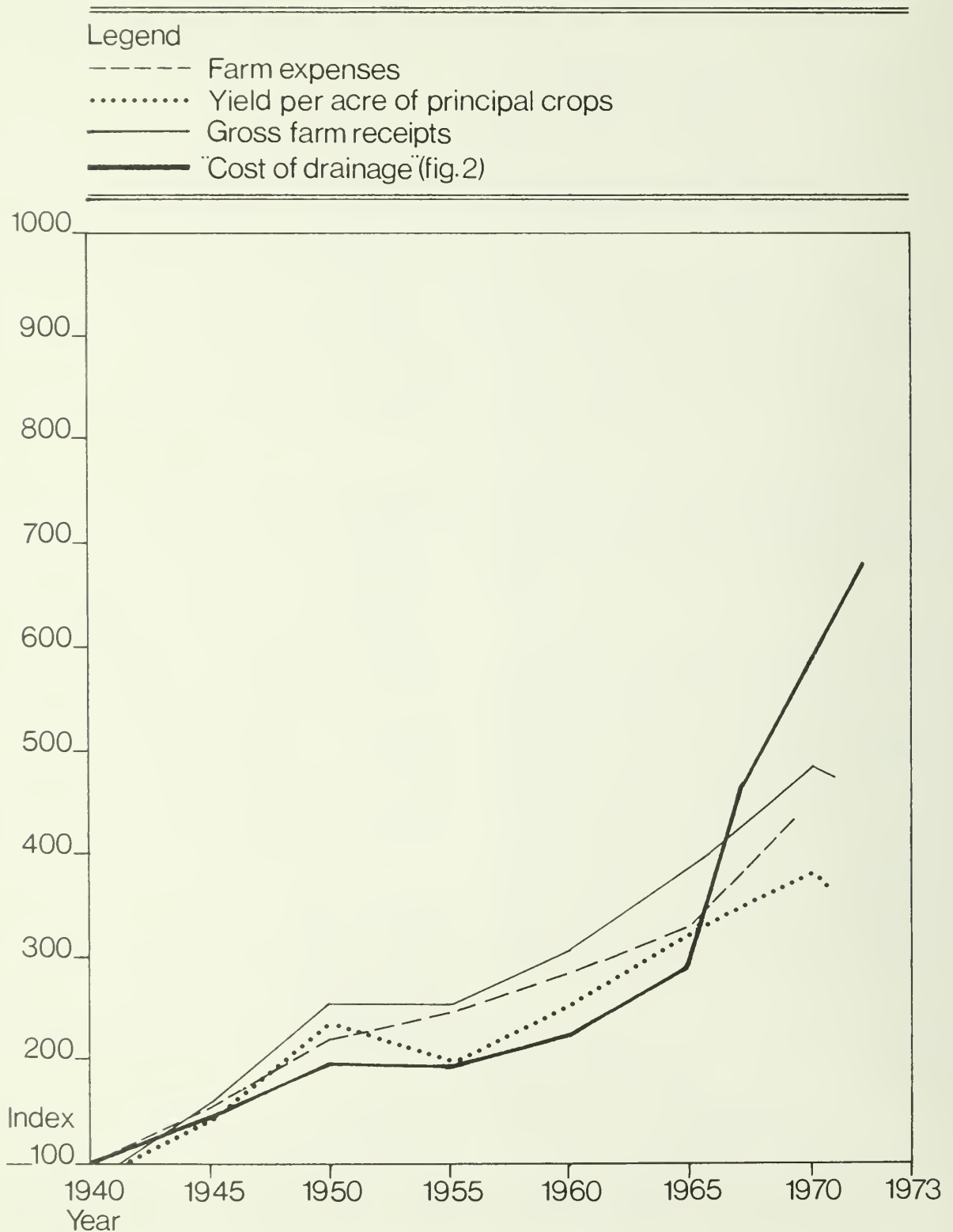
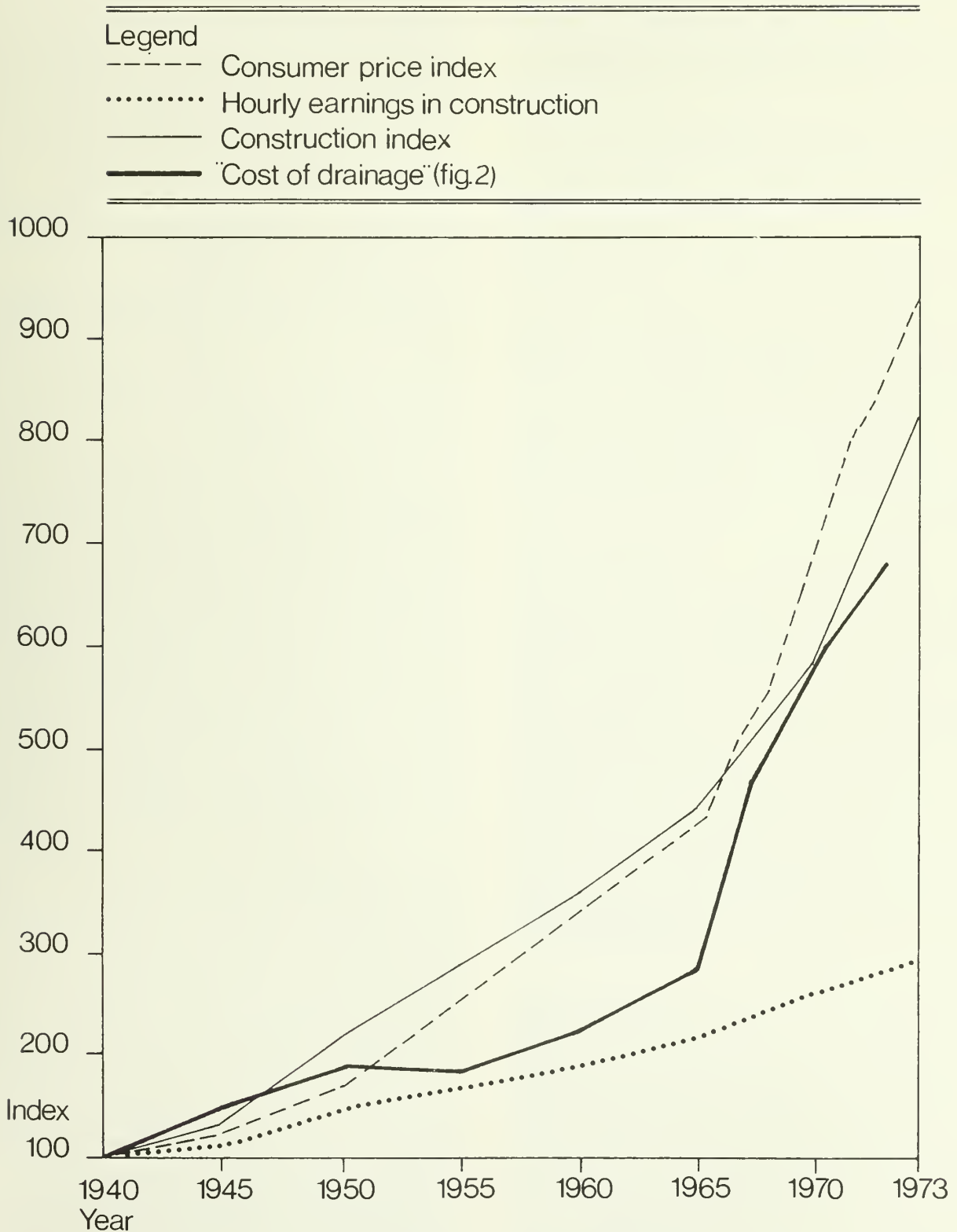


Figure 4
Economic Indicators



consistency and reductions in determining allowances where extremes occur, guidelines for the engineer's use are considered in part IX. Because engineering wage rates will not likely be reduced, it seems that the only way to effect economies in this area is to reduce the time required for preparing reports. Greater use of aerial photographs could reduce the time needed for locating new drains and determining watershed boundaries. This would effect economies in field time and to a lesser extent within the drawing office. Using the more recently developed calculating machines can effect significant time savings in computing estimates and preparing assessment schedules. Many engineers have already reduced specification preparation to a minimum by adapting a general specification for all drainage works and adding special conditions to meet the requirements of each particular project. It is doubtful if the time the engineer spends on providing information to councils and affected owners should be reduced. Based on the complaints heard by the Committee, communications between the engineer and these parties might better be increased in many instances.

It appears that the best way of holding down engineering costs is to try to make available to all engineers the most up-to-date information on methods, materials, and costs. Not only will this help hold down costs, but it should also be reflected in better engineering works. A coordinated effort by the professional associations, the University of Guelph, and the Ministry of Agriculture and Food can best attain this objective.

The administrative costs of processing drainage works could be controlled to an extent by decreasing the number of tasks that must be done. It has been suggested in many areas that the 1970 amendment to The Drainage Act which requires copies of the report (including plans and specifications), to be mailed twice to all owners who are assessed or receive allowances, is cumbersome and expensive. The Committee recommends in part XV that the plan and profile be included with the report when notice of its consideration is given. It was felt however, that only the by-law form which relates to the financial aspects as well as a clear, concise outline of the appeal procedure be forwarded to all affected parties after the provisional by-law has been adopted. The Committee also recommends elsewhere in this report that properties in urban areas not be individually assessed and this recommendation will produce considerable administration economies.

The Committee has reviewed in detail the proposition that the owners within the individual drainage areas should bear the administrative costs relating to drainage by-laws. It has been noted that administration costs for other types of services relating to specific areas, are borne out of the general funds of the township. It was also noted that the administrative staff of most rural municipalities has become full-time and the work relating to Drainage Act projects is carried out by this staff during office hours as part of their normal duties. **The Committee recommends** that the legislation be changed so that administrative

expenses related to drainage works be considered part of the general administrative operation of the municipality and not be included in the direct charges assessed against a drainage works.

The key to economical and effective supervision of drainage works is a competent and conscientious drainage commissioner. Where there is a commissioner who is performing his duties in the proper manner and obtaining direction and advice from the engineer when required, it appears that the money being spent on the supervision is being used wisely. The combination of an able commissioner working in full cooperation with the engineer is considered to be the most effective arrangement possible. It is also worth noting that a commissioner who organizes and carries out maintenance and repair programs on municipal drains can effect substantial long-term savings as well as improved continuing drainage to the farmers. The Committee's recommendations concerning the drainage commissioner are included elsewhere (part X) in this report.

Long-term drainage costs would certainly be reduced by providing the most effective type and size of drain. This allows money to be well spent. Everything possible should be done to make sure the right decision is made on the kind of drain to be built, even though somewhat more money may have to be spent on additional investigation.

In conclusion, it can be seen from Figures 2, 3 and 4 that the trend of drainage costs has been upward. The trend slowed somewhat through the mid-1960's, but has been about the same as other construction costs since 1965. And until 1967, it did not differ much from the farm price indicators. The fastest increase in drainage costs seemed to coincide with the availability of A.R.D.A. grants, although the increase was also related to additional work being done on projects. Because drainage work is labor intensive, the greatest influence on drainage costs has been the rise in wages and salaries. Also, the increase in procedural requirements is not to be overlooked. It is probably safe to assume that, except for the latter point, this trend toward cost increases will continue. There does not appear to be any way to effect substantial real savings in the cost of drainage works.

Because of the great variety in Ontario topography, soil, climate, farming techniques, maintenance experience, and so on, it is impossible to generalize on the cost of maintaining drainage works. Weed and brush control techniques for open ditches are changing faster than perhaps any other aspect of drainage work. In any case, maintenance costs can best be controlled by initially ensuring proper construction of the drainage works and by following with an organized program of continuing maintenance throughout the drain's life. This can only be effectively undertaken if all those concerned with drainage activity are kept aware of innovations in methods and equipment. The Committee feels that the dissemination of this type of information should be carried out under programs of the Ontario Ministry of Agriculture and Food in cooperation with the University of Guelph.

VIII. THE PETITION PROCEDURE

A drainage work is established in Ontario in accordance with Section 3 (1) of The Drainage Act. A petition of landowners to the council of the municipality is required. To be valid, the petition must contain the signatures of a "majority in the number of owners as shown by the last revised assessment roll to be owners of lands and roads in the area requiring drainage as described in the petition." This wording immediately presents some difficulties. The tax roll usually includes husband and wife where the land or the farm is owned in joint tenancy and also includes lands owned by as many as seven or eight people. A petition once was ruled invalid because the petitioners forgot to include the required number of signatures of wives.

Another problem revolves around the phrase "the area requiring drainage." At one time, the legislation spoke of "lands to be benefited in the area described," but this was changed because it became apparent that the council, on receipt of the petition, could not determine which lands were to be benefited until they engaged an engineer and gave him this responsibility. In many cases, the municipal clerk merely computed the number of petitioners as a percentage of the total owners on the tax roll within the area described and assumed that the area was the one to be benefited. When the Act was changed to "in the area requiring drainage," it was not of any greater help because the council was still unable to decide whether or not an area required drainage unless they had personal knowledge of the area or the expert advice of an engineer. The Committee has been informed of cases where managed areas have been devised and a majority petition raised within the managed area.

There have not been many cases in the law regarding this problem. In those that could be traced, however, the referee or the court held that the engineer was beyond his authority when he reported to the council on an area greater than that described in the petition. There is one case on record where an engineer's report was rejected because it described an area which the engineer felt was a logical drainage area or basin but which was not similar to that described in the petition.

In rejecting the above engineer's report, the drainage referee said, in part:

"... a petition must describe a real drainage area and it follows that there was an obligation on a council before acting on a petition to satisfy itself that a real drainage area was described in the petition . . . In my view a

council must come to a conclusion as to whether or not the petition describes a real drainage area. . . ."

The problem with this judgment is that it leaves the council to decide the real drainage area, which is something it cannot do without expert advice. The Committee trusts that its recommendations in this section will solve this problem.

Another difficult problem regarding petitions is that of obtaining the required number of signatures when the area requiring drainage has several properties that may be small holdings of one or two acres. There might also be larger acreages owned by hobby farmers or city dwellers seeking a rural retreat. In such cases, it is difficult for full time farmers to raise a drainage petition because small holders or weekend hobby farmers are disinterested in drainage. The Committee was told of numerous cases where petitions failed because signatures were not easily obtained from such people. Perhaps in some cases these frustrations led to devised or managed areas as mentioned above.

The Committee was also made aware of what many briefs and submissions referred to as "the indiscriminate drainage of wetlands." Petitions raised in some drainage areas could request drain construction to the detriment of the environment or to the natural resources. The Committee agrees that construction of agricultural drains in the past had little or no regard for environmental impacts and appreciated the obvious sincerity of the conservation-minded people from agencies such as the Conservation Council, the Conservation Authorities, and the Ministry of Natural Resources who appeared before the Committee. However, the Committee's research does not support the requests for restraints on the expansion of agricultural land drainage because of the detrimental effect on the environment.

The Committee's hearings made it aware that some drains were built which did not return benefits equivalent to costs within a reasonable time. Research on this problem found that approximately 30 to 35 percent of the drains examined would not pay their way in the foreseeable future. Similarly, the A.R.D.A. Branch of the Ministry of Agriculture and Food reported in a special 1972 study on A.R.D.A.-assisted drains that about one third of the drains studied did not have positive benefit-cost ratios. The Committee believes that steps should be taken to ensure that drains return to the landowner the value he expects from the total cost of the drainage works and also that public funds invested in drainage by the

governments of Ontario and Canada through A.R.D.A. yield positive returns. The proposed petition procedure accordingly gives the matter of costs and benefits major consideration.

Proposed Procedures

Recognizing the foregoing considerations, **the Committee recommends** that the present section 3 be amended in certain respects and that procedures relating to the submission of a final report, be modified so that in most cases, the problems that have been brought to the attention of the Committee can be avoided. Specifically, we recommend that section 3 (1) be redrafted so that a valid petition will consist of signatures representing a majority of the properties, (that is, one signature per property to be benefited as shown on the last revised assessment roll) or any number of properties representing 60 percent of the total acreage to be benefited. When a petition is raised and presented to council, and confirmed by an engineer, council may then proceed or not as they decide. **The Committee further recommends** that the phrase "area requiring drainage" be replaced by "area to be benefited as determined by the engineer" and that Subsection 4 be deleted since the Committee considers that a pumping installation should not be treated differently than any other type of drainage works for purposes of the initiation of a scheme. The foregoing recommendations will resolve problems relating to multiple signatures for single properties, small holdings frustrating the implementation of agricultural drains and the determination of lands to be benefited. It follows that it would be incumbent upon the engineer to determine the area to be benefited to confirm the validity of any petition before undertaking any other duties. Furthermore, before the council makes any decision as to whether or not to accept the petition, the council must appoint an engineer whose duty at this stage is to do nothing more than confirm the validity or otherwise of the petition and define the drainage area to be benefited.

With respect to difficulties encountered by full-time farmers where hobby farmers and land speculators prevent the raising of a majority petition, the Committee has noted that the present Subsection 2 provides for initiating proceedings for the drainage of a road on a petition of the interested authority and feels that the circumstances are somewhat similar. Therefore, **the Committee recommends** that an additional subsection be added whereby the Minister of Agriculture and Food, upon the application of interested parties could petition for the initiating of a drainage works.

The Committee considers that the foregoing recommendations will accommodate the great majority of drainage schemes within the Province. However, we feel that environmental impact and benefit/cost considerations cannot be ignored by any council when considering a drainage scheme. Therefore, it is recommended that an environmental impact statement and benefit/cost certificate as described later in this part be filed with the engineer's report.

The Committee also recognizes that in some instances preliminary information will be necessary prior to the authorization of a final report. This could involve environmental impact, benefit/cost calculations, or a preliminary engineering study and it is recommended that councils be permitted to authorize any or all of these elements to be furnished prior to accepting the petition. **The Committee** considers that such information in many instances, will prove of great value and **recommends** that the usual grants be made available for this purpose.

Where the council requests this preliminary information before making a decision as to whether or not to accept the petition, it is felt the balance of the costs after the grants should be the responsibility of the council.

Accordingly, **the Committee recommends** that in addition to the matters presently in section 3, the Act should provide the following:

1. When a petition of landowners is given to a municipal council for the construction of drainage works, the council must first appoint an engineer whose only duty at that stage is to define the area to be benefited and determine the validity of the petition.
2. The council may, following the engineer's validation of the petition, decide to proceed with the drainage works, at which time, the council must order the preparation of an environmental impact statement, a benefit/cost certificate and an engineer's final report.
3. In the alternative, the council may, prior to accepting the petition, decide that it wishes further information, in which case it may order the preparation of any of an environmental impact statement, a benefit/cost statement or a pre-engineering study. If, after receiving this information, the council decides to proceed, the council must order the preparation of an environmental impact statement and a benefit/cost statement if they were not obtained before. Rights of appeal will arise as outlined in Part XIII.

The successful application of these proposals depends to a great extent on the knowledgeability of the farmers and the knowledgeability and attitudes of municipal councils.

An Alternative Procedure

In some areas of the province, the Committee was made aware of disturbingly negative attitudes on the part of municipal councils wherein, based on the evidence heard, worthwhile schemes were being prevented.

Lack of information concerning the proposed projects appeared to pose the chief stumbling block along with a reticence on the part of some councils to act. With this thought in mind, **the Committee recommends** that another procedural avenue be provided, as a new section to the Act, to ensure that the information necessary is provided to all concerned as a basis for supporting or not supporting a petition for a drainage works.

The Committee recommends that any local municipality should be **required** to act on the request of one or more ratepayers to initiate a preliminary examination of any new drainage works proposed in the request. It should be understood that the persons signing this request, in so doing, guarantee the payment of the costs of such preliminary examination. **The committee recommends** that part of the cost be paid as a subsidy by the Ministry of Agriculture and Food on the same scale as the normal grant structure.

The preliminary examination should consist of three reports: (1) an environmental impact statement; (2) benefit-cost calculations; and (3) a preliminary report by the engineer giving reasonable estimates of the total cost of the proposed works and alternatives. The Committee does not anticipate that the costs of these studies will be excessive but costs will vary depending on the size of the project proposed and the area of the province in which the proposal is initiated.

An Environmental Impact Statement

It is envisaged that an environmental impact statement would be produced by a committee of three people appointed by the municipal council and consisting of a representative of the local office of the Ministry of Agriculture and Food, the Conservation Authority resources manager (or where there is no conservation authority, a representative of the Ministry of Natural Resources, or where neither of these is available, a representative of the regional office of the Ministry of the Environment), and an impartial ratepayer resident in the municipality who would act as chairman.

The Committee was impressed with the principles and procedures outlined in the Green Paper on Environmental Assessment issued in September 1973 by the Ministry of the Environment. While this paper contemplates such assessments being made on major projects such as river dams, power projects, factories, and other installations which have significant environmental effects, it has relevance to our proposals in this instance. The Green Paper indicates that an environmental assessment is intended to facilitate the identification and resolution of environmental problems at an early stage, and this is essential in proposed new drainage works.

While the Committee is not completely persuaded that agricultural drains have great environmental impact in every case, it is prepared to recognize the possibility. Accordingly, **the Committee recommends** that an environmental impact statement on every new drain proposed in Ontario be filed with the council of the municipality in which the drainage works is proposed. The Committee feels that in many cases the environmental impact committee's report to council will be merely a brief statement to the effect that the work has been completed and that the conclusion is the environmental impact is nil. The environmental impact committee would, it is expected, make a more detailed and more formal report where there are complications.

Borrowing from the guidelines laid down in the Green Paper on Environmental Assessment, **it is recommended** that the basic environmental assessment document filed with the council would contain the following elements:

1. A project description which should be a brief but comprehensive outline of the project including a statement of objectives, physical description, proposed construction methods, and operating and maintenance procedures. Alternatives should be pointed out, including the alternative of not proceeding.

2. An environmental inventory including identification of the flora and fauna, geography of the site, probable changes in land use, and other factors that might be necessary to describe the situation.

3. A prediction of the impact on the natural environment as it applies to wildlife, lands and crops, and water resources.

4. A final evaluation which would set out the consequences of the project and its alternatives, including the environmental risks involved in undertaking the project.

Benefit-Cost Considerations

The present Drainage Act makes only passing reference to benefits and costs as related to drainage projects. Section 8 (10) of the Act provides that an engineer must report to the council the fact that he found a proposed works to be not required or impractical. Any landowner affected may appeal this report to the referee. It has been suggested to the Committee that an engineer seldom reports a project to be impractical, but usually accepts his appointment as an assignment to design and lay out a drainage works.

Section 36 of the Act indicates that any owner of land affected may appeal the engineer's report to the referee on the grounds "that the benefits to be derived from the drainage works are not commensurate with the estimated cost thereof." While the landowner may appeal on the grounds of a suspected negative benefit-cost ratio, it is obvious that he is not equipped or qualified to generate the data required to demonstrate that such a negative ratio actually exists.

The Committee finds that the Act's references to costs and benefits do not adequately serve present day requirements. Therefore, **the Committee recommends** that the engineer file with the council, a certificate, over his signature and under his seal, setting out that, in his professional opinion, the benefits accruing from the work will exceed the estimated costs or vice versa as established in the preliminary or final report as the case may be. Guidance for the engineer in arriving at this opinion, is available to him from study of the material and procedures in part VI of this report.

It is expected that the engineer will consult with the staff of the local office of the Ministry of Agriculture and Food or any other logical source of information in order to obtain data on yields, crop prices, etc. necessary for the formation of his conclusion.

In order to give the council a basis for decision, the engineer's certificate should indicate the degree of plus or minus that his opinion reflects. The Committee feels that such information would be of great assistance to the council in taking a decision to proceed or not.

As mentioned in part VI, there is a possibility that because of the legal requirement for outlet assessment on lands where improved drainage only is provided or indeed where the liability only is assessed, negative benefit-cost ratios may be quite frequently found by engineers. In these cases, the Committee strongly holds the view that responsible councils will make their decision based on their knowledge of the area and local conditions, yet fully aware that such decisions are subject to appeal by disaffected rate-payers or groups.

Preliminary Engineering and Report

During the Committee's hearings, particularly in the areas where municipal drainage activity has not been great in the past, the Committee heard from many individuals who felt that their rights had not been properly respected in the petition procedure. Some reported that they had been shocked to receive the engineer's report and realize the size of the assessment that they had committed themselves to when, they, as a favour, signed a petition at the urging of a neighbour. This dissatisfaction comes about because the present Act does not provide a means by which persons unfamiliar with the implications of a drainage scheme may obtain information upon which to base their decision whether or not to support a petition. Affected owners have often not been consulted or advised of possible alternative courses of action until the final report has been actually submitted. In the opinion of the Committee, there have been too many occasions in the past, where farmers have agreed to the proposal of a new drainage works without being in possession of sufficient information. The Committee feels that the filing of a pre-engineering report would do much to remove uncertainties and doubts.

The Committee therefore proposes that this new procedural avenue would require the engineer to make a preliminary examination and report to the council that would include: (1) a sketch plan indicating the tributary area and the benefiting lands; (2) input from all concerned ratepayers, railways, utilities, road authorities, etc.; (3) an on site meeting to be called by the township clerk; (4) a description of the proposed works with alternatives set out (for example, closed or open); (5) estimates of the cost of various alternatives.

It is proposed that the three reports to the council be filed within 45 days from the time of appointment of both the engineer and the environmental impact committee with power in council, by resolution, to extend the time up to a further 60 days.

On receipt of the reports and within 30 days of the filing date, the council must call a meeting of all rate-payers assessable for benefits (including utilities and railways), members of the environmental impact committee, and the engineer who prepared the benefit/cost statement and the preliminary engineering report. Subsequent to this meeting, after everyone concerned is aware of the costs and other factors, 60 days would be allowed for raising a valid petition and filing it with the council. If no valid petition has been received at the expiration of 60 days, the clerk would then notify the original petitioners and give them a 30-day deadline to file a petition, or failing that, to have the cost to date less grants added to the tax roll against their names, thus closing the matter.

The council is then faced with three technical reports on the project along with a valid petition and must now decide whether or not to proceed. If the council decides not to proceed despite three obviously favourable reports, an appeal procedure should be provided. Should it decide to proceed despite an unfavourable environmental impact report, an appeal may be launched on behalf of the environmental interests by the Minister of Natural Resources. If the council's decision frustrates farmers in their drainage requirements, the Minister of Agriculture and Food may launch the appeal.

Where the project proceeds after appeals and after the petition is signed, the costs of the preliminary studies should form part of the cost of the drainage works as calculated by the engineer. Where the project is accepted by the council but denied on appeal, the costs of the preliminary report must be paid by the municipality out of general funds and subsidized by the Ministry of Agriculture and Food, within the normal grant structure. Where the project is denied both by council and on appeal, the preliminary costs must be paid by all the petitioners and not just those who signed the original request. In this case also, similar grants would be available from OMAF.

The Committee feels that the council must assume some responsibility and that the project becomes the council's burden when it accepts the petition. Where the council votes against a proposal, however, and the appeal upholds the council's decision, then the petitioners pay their part of the costs of the preliminary examination.

It should be understood that requests such as those from the Minister of Agriculture and Food and from the Minister of Transportation and Communications are to be treated similarly to requests from a ratepayer and that the three preliminary reports must be filed with the council. The council keeps its responsibility of making the final decision. Requests from either Ministry are not to be construed as mandatory on the council to carry out the complete proposal and construct the works.

IX. THE ENGINEER

The Present Function of the Engineer

The engineer performs one of the most important functions under the present Drainage Act, with his appointment being a pre-condition to many of the projects that can be undertaken under The Act. The engineer's function has been described as semi-judicial in nature since he determines many matters which directly affect the rights of individuals. It is inaccurate perhaps to describe the engineer as an employee of the municipal council or of anyone else. His appointment and duties are specifically prescribed in The Act, and the method of carrying out those duties is not to be dictated by any other agency.

The definition of engineer in The Drainage Act includes a surveyor registered under The Surveyors Act. Therefore, an Ontario land surveyor can be appointed under The Drainage Act. For convenience, however, the Committee will refer to the engineer as the person appointed to perform the statutory duties imposed on him. The Committee has recommended elsewhere in this report (part XV) that the definition of engineer be amended to include corporations and partnerships of engineers and Ontario land surveyors.

There are several sections of The Act under which the engineer's appointment can be made. Under Section 19, an engineer can be appointed to apportion the assessment charged against a parcel of land where that parcel is divided by a change of ownership. An engineer can be appointed under Section 51 to vary an assessment on the grounds of changed circumstances. Under Section 52 (2), an engineer is appointed where the Province of Ontario or any municipality or suburban road commission relocates a drainage works that is on or adjacent to a road. An engineer is appointed under Section 4 when drainage works are to be constructed on requisition. The most important sections under which the engineer is appointed are 3, 49, and 53 where, respectively, drainage works are constructed on petition, drains are to be maintained or repaired, and drains are to be improved.

The duties of the engineer are contained in Sections 3, 4, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, and 18, the most important of which is Section 8. In essence, the engineer is required to make an examination of the area, and to prepare a report including plans, specifications, cost estimates of the drainage works, and an assessment against the lands and roads in the area requiring drainage. He has the power to enter upon any land during the course of his examination. Under Section 8, he is required to specify the structures necessary for the works, such as bridges and

culverts, and he must allow compensation to owners of land for certain matters such as damage to crops, severance, private drains, rights of way, and the impracticability of taking a drain to a sufficient outlet.

In determining the assessment to be imposed on the lands and roads to be benefited by the drainage works, the engineer is required to show the approximate number of acres affected by the drainage works in each parcel. He must assess for benefit, outlet liability, and injuring liability, and he must separately list the lands in each municipality that are assessed. Within six months after his appointment, the engineer must prepare a formal report and file it with the clerk of the initiating municipality. The engineer's greatest contact and possible conflict with the general public arises from his determination of the appropriate assessments on particular parcels of land and the allowances he must grant for such matters as severance, damage, and rights of way.

Difficulties with the Present System

In general, the Committee is satisfied that the present system works with reasonable efficiency and that the present functions of the engineer should be retained. The engineer is the most qualified person to plan the nature and structure of drainage works in a detailed way. Assessments and allowances are so intertwined with the works themselves that the engineer should continue to be responsible for determining them.

The Committee received a large number of criticisms and complaints that related more to the manner in which the engineer's functions are performed than to whether or not the engineer is the appropriate person to perform them. Aside from the occasional complaint of incompetence, the major criticisms were aimed at the engineers' reports and concerned lack of detail, difficulty of understanding, failure to set out project objectives, insufficient specifications, lack of clarity in financial details including estimates, assessments, and allowances, and lack of communication between the engineer and the parties affected by his report. Although some of these criticisms are justified, the committee feels that most of them arise from a lack of communication and from the notable lack of uniformity to date in the way engineers conduct their examinations and prepare their reports. Furthermore, there has been insufficient direction given to engineers by public agencies and professional associations.

Criticisms were also directed at the Court of Revision where, on assessment appeals, the engineer's assessment is often accepted by Court members who

are usually the same municipal councillors who adopted the engineer's report. Many feel that if the engineer is present at the Court of Revision, the landowner has little chance of successfully challenging the assessment.

Proposals

As already mentioned, the Committee believes that the basic system presently in effect should be continued. However, the Committee feels the system can be made more effective if two basic principles are borne in mind. First, there should be a greater degree of communication between the engineer and all affected parties, including landowners, public utilities, road authorities, municipal councils, conservation authorities, and government agencies. Second, measures should be taken to ensure much more uniformity in the way engineers' reports are prepared and assessments and allowances are calculated. The Committee's recommendations in this part of the report are intended to advance these basic objectives.

The Committee recommended elsewhere in this report (part VIII) that all affected parties in the construction of a new drain should be given notice of the proceedings at each stage. Notice will be given before work begins on either the preliminary studies where authorized or on the preparation of the final report. In every case where new construction or major improvements are anticipated, an on site meeting will be held to allow all concerned the opportunity of making representations. The Committee hopes that these provisions will effectively increase awareness of the conduct of the project and the engineer's role in it and that they will decrease the unfamiliarity with the engineer's function that has, to date, produced some dissatisfaction.

The Committee believes it is of paramount importance to develop guidelines and uniform procedures if the construction of drainage works throughout the Province is to be maintained at a consistently high level. The Committee does not intend to tie the engineer's hands in exercising his professional judgement, but some direction nevertheless is needed. Some of the Committee's recommendations will involve amendments to the legislation, others will simply attempt to assist the engineer in his duties, and still others will relate to efforts that government agencies and professional organizations will have to make at a later date.

The Committee recommends as follows:

1. The engineer has been defined in part XV of this report. Where the engineer appointed is a corporation, association, or partnership, **the Committee recommends** that the corporation, association, or partnership should be required within 10 days of the date of appointment to notify the council of the name of the individual engineer or land surveyor who will have charge of the project and who is thereby authorized to sign the necessary documents such as the report, completion certificate, etc.

2. **The Committee recommends** that the first

duty of the engineer in the case of new construction should be to determine the area to be benefited in order to confirm the validity of a petition or to establish the requirements of such a petition where the petition has not yet been raised. In so doing, he must obtain some basic information from the petitioners or initiators of the scheme as to their expectations of the drainage works and the nature of the works required.

3. After the clerk has notified all affected parties in the area to be benefited and other persons required to be notified, **the Committee recommends** that an on-site meeting be held at which the engineer will hear any representations that interested parties wish to make. Where preliminary studies have been authorized, the engineer could make his preliminary examination at the time of the meeting. Where a final report has been authorized, the detailed survey of the drain could be commenced in conjunction with the on-site meeting.

4. In the course of all drainage surveys, **it is recommended** that the engineer be required to place sufficient bench marks to permit reasonable control of elevations for future repairs or improvements. Such bench marks should not be more than one mile apart, and in any case should be available at every road crossing or other logical means of access to the drainage works, exclusive of farmers' lanes, and at each end of shorter drainage projects.

5. The whole of Section 8 of The Drainage Act should be redrafted, since it is presently somewhat confusing and illogical in sequence. **The Committee also recommends** some specific amendments to Section 8. The Committee's attention was drawn to instances where it was unjust to force a public road authority to bear the excess cost of a culvert modification occasioned by a change in land use from agriculture. For example, culverts may not be of sufficient size if parking lots and paved streets and urbanization have increased the rate of run-off. In such instances, required changes should be charged to the drainage works rather than to the road authority. Bearing in mind that the Committee has recommended that public road authorities are to be treated the same as utilities, Subsection 2 of Section 8 should be amended accordingly. Subsection 3 of Section 8 should be deleted entirely. The items covered in Subsections 4 and 5 are related and should be dealt with in one subsection under the revised statute so that the access bridges, farm bridges, and water gates thus dealt with should be built and maintained by the drainage area. Concerning allowances, **the Committee recommends** that the engineer be permitted to grant allowances for matters not strictly within the expression "lands and crops," such as ornamental bushes, lawns, trees, and fences.

6. Where it would be advantageous, the engineer should be required to show assessments in the fractional part of the whole cost as well as in money.

7. **The Committee recommends** that the engineer be given the authority to make block-type

assessments in built-up areas as opposed to the present system of individual assessments on each parcel of land. This would require the engineer to differentiate only between streets eligible for Ministry of Transportation and Communications grants and urban land. He would be required to delineate the areas assessable to the scheme, and the drainage assessment would then be collected by means of a charge against the ratable property within the area to be assessed. This alleviates the necessity of individual treatment and effects a considerable saving in both time and administrative costs.

The Committee recognizes that this recommendation would involve a different approach to the notification of the parties involved and it suggests some form of advertisement such as is used in certain other statutes. The Committee notes that the council presently may, within limitations, absorb small assessments in the general rate of the municipality. The Committee suggests that the council might be given the alternative of either notifying affected parties within the area being assessed or absorbing the assessment in the general rate.

Impressive evidence of the need for a change in assessment procedures for urban areas was presented and, considering the rate of urbanization in the Province, the Committee strongly recommends that appropriate amendments be made to remove the necessity of individual assessments in built-up areas.

8. The engineer should not be permitted to attend the Court of Revision unless his presence is specifically requested by an appellant. If no such request is forthcoming, the engineer should be required to file with the Court of Revision a written statement that gives his reasons for the appealed assessments. A copy of such statement should be forwarded to the appellant prior to the hearing. In appellate proceedings after the Court of Revision, the engineer should make himself available to and co-operate with the municipal council in preparing the appeal.

Suggestions for Improved Procedures by the Engineer

1. The Committee feels that the pre-engineering report should not provide more than an outline of the drainage problems, a discussion of a proposed solution with alternatives, and approximate cost estimates relating thereto. Included with the submission of a pre-engineering report, there should be a sketch plan of the tributary area, the lands to be benefited and the approximate location of the proposed drainage works. The Committee recognizes that more detailed work or supplementary information may be required in some instances to provide council or the affected owners a proper basis for decision. The engineer must therefore be allowed some latitude while at the same time maintaining communication with the council and the affected parties.

The engineer will be preparing his benefit-cost statement either at the time the pre-engineering study is being prepared or in conjunction with the prepara-

tion of the final engineering report. The details of this statement are outlined in part VI of this report.

2. The engineer should attend the municipal council meeting at which the preliminary studies are considered. The engineer can be of invaluable assistance to the council and to interested parties who attend the meeting in explaining his preliminary report and its ramifications.

3. Where a final report has been authorized, the engineer should undertake his field study to obtain the information needed for preparing his report. This field study would include staking and the taking of levels along the course of the work, obtaining details as to channel dimensions, watershed limits, individual parcels of land, and the effect the drainage works will have on those parcels. On completing the field survey and investigation, the engineer should undertake his final design and prepare any required plans, profiles, and detail drawings, as well as the specifications. He must also determine allowances to be granted, estimate the total cost of the drainage works, and prepare assessment schedules.

While the Committee does not wish to lay down firm guidelines as to how assessments and allowances should be prepared, it does note that there is probably less uniformity in the preparation of these matters than in any other aspect of the engineer's report. The engineer must **at least** be fully familiar with the definitions of benefit and outlet liability as redefined in this report. It should be noted that benefit as used for assessment purposes is not the same as the economic benefit related to benefit-cost considerations, although a proportional relationship often exists. This is one aspect that should be co-ordinated between the Association of Professional Engineers, the Association of Ontario Land Surveyors, the Ministry of Agriculture and Food, and the University of Guelph. If these agencies cannot work out such guidelines through co-operative effort, the Committee feels that only the Ministry of Agriculture and Food can do so effectively.

4. The Committee has noted instances in the Province where the design of a particular drainage works has been inappropriate to the needs of the area requiring drainage. Again, the appropriate professional associations and government agencies must work together to provide design and specification guidelines. If the necessary steps are not taken by these bodies, the government itself may be required to act.

5. In both his preliminary and final reports, the engineer must obtain sufficient pertinent information relating to title drain outlets, access culverts, gas and oil pipelines, water and hydro services, buried cables, roads, and railways. The engineer should make every effort to communicate with and co-operate with the agencies responsible for such matters.

6. In preparing his report the engineer should endeavour to explicitly state the problems requiring a solution, the alternatives considered, and his reasons

for adopting the proposed solution. Although details will vary depending on the size and nature of the project, the engineer nevertheless should cover these matters in some way. The engineer's report should provide separate schedules of assessments and allowances for each branch of the drain and composite schedules of assessments and allowances for the drain as a whole. Furthermore, the amount of land assessed in each branch should be stipulated in the schedules.

7. For drain improvements, the engineer should bear in mind that he cannot simply prorate the

assessments which were used for the original drain construction. He must reassess on the basis of the work presently being undertaken and in light of present circumstances.

8. In addition to attending the meeting at which the preliminary report is considered, the engineer should, where circumstances warrant, attend the meeting at which the final report is considered. In general, the engineer should attempt to make himself available to affected owners to discuss and explain the various facets of the proposed scheme.

X. THE DRAINAGE SUPERINTENDENT

Under the present Drainage Act, the council of a local municipality may appoint one or more commissioners to assist the engineer and to supervise the maintenance of any drainage works. The council may require commissioners to report annually on the state of repairs of all drainage works. The commissioner has the same powers to enter land as the engineer. Under Section 55 of the Act, the commissioner has the power to require a person responsible for an obstruction in the drain to remove it.

The Committee believes that the appointment of an officer who reports to the municipal council and is responsible for supervising the construction and maintenance of all drains within the municipality is most worthwhile and should be continued. However, the present Act is deficient in that it does not clearly specify the duties of this officer and makes no mention of any particular qualifications or training he should have. Furthermore, the appointment of such an officer is not mandatory, and many municipalities have not made such appointments.

The Committee therefore recommends that every municipality which undertakes projects under The Drainage Act be required to engage a "Drainage Superintendent." The Committee feels that, while perhaps it is only a matter of preference, the change in name would serve to distinguish this official from the commissioners appointed under the present Section 59 to operate and maintain pumping schemes. In the Committee's opinion, the latter commissioners still would be necessary, although their status would be secondary to the drainage superintendent. The Committee recognizes that some municipalities may find it difficult to justify a full-time superintendent. It would be possible, however, for two or more municipalities to jointly retain a superintendent or for a municipality to engage a part-time superintendent who is capable of becoming qualified.

Duties of the Superintendent

While the duties of the drainage superintendent must necessarily be somewhat general, they can be divided into two major areas of responsibility:

1. The implementation of new construction of or major improvements to the drainage works; and
2. Maintenance, repairs, and minor improvements to the drainage works.

The implementation of new construction and improvements would necessarily be carried out in co-operation with the engineer. The superintendent's duties should include making arrangements for tend-

ers, evaluating the contractors' bids, and submitting recommendations to the council, as well as providing on-site supervision of the construction operations including the authorization of progress payments where applicable. These functions would be carried out while maintaining sufficient liaison with the engineer so that the engineer will be in a position to properly sign certificates of completion for making final payment to the contractor and suppliers and for Ministry of Agriculture grants. The superintendent should be given sufficient latitude to make reasonable minor changes in the specifications where field conditions or common sense dictate, provided that such changes do not affect the capacity or effectiveness of the drainage works. He should also be required to maintain liaison with all property owners affected by the construction of or improvement to the drainage works.

It is anticipated that the superintendent would systematically organize and implement programs to maintain and undertake repairs to all the municipal drains under his jurisdiction. In the case of improvements made without the necessity of an engineer's report the drainage superintendent should provide guidance to the council as to the advisability of such a step in addition to subsequently arranging for and supervising the work.

Since the Committee recommends (part XI) that the functions of maintenance, repair, and minor improvements be undertaken within budgetary limitations established by the Ministry of Agriculture and Food, it would be the drainage superintendent's duty to make the necessary submissions to the Ministry so that the proposals could be reviewed and budgets established for grant purposes.

The Committee recommends that the drainage superintendent be required to report to the municipal council periodically on the condition of all drains within the municipality. It would be necessary for the superintendent to maintain contact with landowners as to the condition of local drains, particularly in municipalities where there is a great deal of drainage activity and where it would be impossible for the superintendent to physically inspect all drains.

Qualifications and Training

The superintendent must be capable of interpreting plans, profiles, and other related documents such as the engineer's report and the specifications. He should have a working knowledge of the engineer's level and should be able to set and check grades in the field. He should have some knowledge of financial matters so that he will be able to control costing; that is, he should be able to maintain running totals on

expenditures and summarize costs upon completion. He should have or be capable of assimilating a general knowledge of basic drain design, erosion control, and in some cases pumping operations. The Committee feels that these are the minimum qualifications for a competent drainage superintendent.

The present Act makes no mention of any particular qualifications and does not require any particular course of study to acquire them.

The Committee therefore recommends that the proposed drainage superintendent be required to successfully complete a course of study satisfactory to the Ministry of Agriculture and Food. The Ministry of Agriculture and Food and the University of Guelph should jointly establish a program to develop a suitable course with an examination to initially qualify the superintendents. The Ministry and University should also undertake a continuing program of education in which all drainage superintendents would be required to participate so that they may be kept fully aware of improving techniques, materials, and equipment.

Local municipalities should be required to arrange for the superintendent's attendance and financing at such courses. Expenses incurred for this purpose should be eligible for grants from the Ministry of Agriculture and Food.

Compensation

The Committee has carefully considered the proposition that there is a similarity between a township drainage superintendent and a road superintendent. The road superintendent supervises maintenance and construction programs relating to the roads system throughout the township. The Committee has noted that such road construction projects often benefit only specific areas of a municipality and that the road superintendent's duties involve the implementation of these projects. Similarly the drainage superintendent's responsibilities benefit specific areas in a municipality. Therefore, **the Committee recommends** that the drainage superintendent's salary be borne by the general rate of the municipality. While this could be considered a burden on residential sections of a municipality, it was noted that there are officials in most rural-urban municipalities who are paid out of the general rate of the township while basically providing service only for the urban areas. Since the basic functions of the drainage superintendent are intended to properly implement and prolong the useful life of municipal drains, **the Committee also recommends** that the salary of the superintendent be subject to the normal grant structure and available from the Ministry of Agriculture and Food.



Bank erosion on an open drain — a job for the Drainage Superintendent.



Inlet erosion and improperly leveled spoil bank.

XI. MAINTENANCE, REPAIR, AND IMPROVEMENT

The treatment of drains after they have been originally constructed was the subject of much discussion both at the Committee's public hearings and in its subsequent deliberations. In introducing the topic, it would seem appropriate to first define the terms the Committee agreed upon during its study of this area. These can then be amplified by discussing their functions in the operation of a drainage works. This discussion also involves the procedural aspects of implementing the various operations by a municipality. The Committee adopted the following definitions to differentiate between the objectives and the means by which these objectives should be achieved:

1. Maintenance: means the preservation of a drainage works;
2. Repair: means the restoration of a drainage works to its original condition;
3. Improvement: means the reconstruction of or adding to a drainage works so as to increase the effectiveness of the system.

Maintenance and repair are implemented at present under Section 49 of the Act and are considered synonymous to all intents and purposes. The Committee does not consider this sameness to be entirely true of the objectives, and the two functions will be treated separately in this discussion. An analogy might be drawn between the maintenance of a car, which is generally considered to involve oil changes, lubrication, etc., and the repair of a car, which might mean rebuilding a motor due either to lack of maintenance or to its age. In other words, the Committee viewed maintenance as taking steps to avoid the need for repair work. For the most part, this concept limits maintenance of drainage works to vegetation-control undertaken as a preventative measure where this was not provided for originally.

Maintenance procedures, then, generally involve operations that are intended to retard or prevent the growth of vegetation harmful to a drainage works and to remove such growth or other debris before the drainage works can be adversely affected. These operations could also include planting appropriate types of vegetation on channel banks or in natural runs above tile drains to stabilize the soil conditions and inhibit erosion. As a preventative measure, erosion protection by the use of riprap, piping, or other structural means might be regarded as maintenance under certain circumstances. However, these operations would be better considered as part of drain construction.

Repairs are steps that must be taken to restore a drainage works to its original condition when it has deteriorated to the extent that the system is not operating effectively. The need for repairs can be attributed to faulty design, poor construction methods, lack of proper maintenance, or the age of the drainage works. Some types of drainage works eventually break down and become ineffective even with regular maintenance. Repairs involve removing sediment and other debris that has washed into the open channel or tile drain due to erosion or that has built up over the years and also repairing washouts and erosion on these drains. In the case of pumping installations, repairs can be mechanical in nature or can relate to erosion in the area of the pumphouse or in the dyking system. In short, repair work is intended to make a drainage installation comparable to that originally installed and is the appropriate treatment to be undertaken when the original installation is still adequate for the needs of the drainage area.

The nature and degree of improvements to a drainage system are almost unlimited. At present, Section 52 of The Drainage Act provides a means by which minor improvements may be undertaken without an engineer's report. Such improvements usually involve deepening an open channel or part thereof to provide a proper outlet for surface or sub-surface installations constructed subsequent to the municipal drain. Another logical application is extending the drainage works downstream from the original termination where it proves beneficial to the system.

Improvements that require an engineer's services are presently done under Section 53 and generally relate to substantial enlargements of open and covered drains or increased capacity, improved controls, or major modifications to a pumping system.

The Committee deliberated at length on the foregoing objectives, the means of obtaining these objectives, and also by whom and how they would be implemented. At present, maintenance, repair, and minor improvements can be undertaken without an engineer's report and **the Committee recommends** that this be continued. **The Committee also recommends** that Ministry of Agriculture and Food grants be extended with certain limitations to these activities. Briefly, these limitations would involve budgetary restraints imposed by the Ministry in the case of maintenance and repair, which as now would be dealt with as one function. In addition to the Ministry budgetary restraints, the minor improvements could not exceed prescribed financial limits (see part XV, Section 52). Also, grants would not be made available where a

municipality has not engaged a qualified drainage superintendent.

The Committee decided that the drainage superintendent could initiate these programs with the approval of the council. Programs would be based on the superintendent's recommendations, complaints by affected parties, and other input received by the council. The Committee also felt that the recommended limitations on these minor improvements were sufficient, and alleviated the requirement for any avenue of appeal by affected parties on their assessments. The Committee did recognize and has recommended accordingly the need for a means similar to that provided by the present Section 51, whereby a new assessment could be obtained from an engineer where the situation warrants.

Major improvements requiring an engineer's services must be effected by passing a by-law similar to that required for the initial construction of a drain. Since the need for drainage has already been established in these cases, the Committee did not consider that a majority petition of the benefiting properties should be required. However, considering the changing requirements and objectives which often dictate major modifications to a scheme, **the Committee recommends** that environmental impact and benefit-cost statements be filed with the engineer's final report. Also similar to the case of initiating a new scheme, the Committee recognizes the need in certain instances for preliminary information before proceeding with a final report. **The Committee therefore recommends** that the council be permitted to authorize that any or all of the following elements be included in the preliminary information: environmental impact statement, benefit-cost statement, a preliminary engineering study, and that grants be made available for the costs incurred.

The Committee has evolved a procedure that is intended to permit these projects to proceed expeditiously while at the same time insuring that all affected parties have ample opportunity to provide input relating to their specific requirements. The following step-by-step outline is the procedure the Committee recommends for processing a project which has either been activated on the notice of an affected owner (including the road superintendent), or by the recommendation of the drainage superintendent.

1. The clerk of the township council notifies all affected parties including the Ministry of Agriculture and Food that work on a drainage scheme is contemplated. A period of 20 days is allowed for these parties to make submissions to the council with respect to the drainage works.

2. At the next regular meeting of council following expiration of the 20 days, the council engages an engineer with instructions either to obtain preliminary information or to proceed with a final report. Any preliminary information developed is intended only for the use of the council in its decision on the advisability to proceed. The decision of the council at this stage is subject to appeal by any affected party.

3. In the case of a decision to proceed, the engineer prepares and submits his final report on the drainage works. At this time, the clerk must notify the affected parties of the filing of the report and must place the consideration of the report on the agenda for the next council meeting, providing a minimum of 10 days notice.

4. Council considers the report and, if it is adopted, all procedures thereon shall conform with those set out elsewhere in this report (part XV).

XII. CONSTRUCTION PRACTICES

The drainage construction practices that have evolved over the years have been dependent to a great extent on the technological advances in equipment and materials. Private farm drainage systems that are intended to remove surface water only are constructed as open ditches, varying from plowed furrows to channels that are excavated by draglines, back-hoes, or bulldozer-type equipment. Open channel drains are also used in private construction as outlets for underdrains.

Underdrainage has been provided almost exclusively by clay tile, although perforated plastic pipe has become widely used more recently. The standard tile size is presently 4 inches and may be spaced from 20 to 100 feet apart in flat lands. In rolling country, the tile lines often follow the low water runs and usually pass beneath the low spots in the field. Main or header tile are often used instead of ditch-type collectors and discharge into municipal outlet drains or natural watercourses.

The majority of the installations for municipal drains are open channels. At present these channels generally have a minimum bottom width of 3 feet and vary in depth depending on the objectives. A channel conducting surface water only is not likely to be as deep as one conducting subdrainage. The side slopes vary from 1 foot horizontal to 1 foot vertical in heavy soils to as much as 4 feet horizontal to 1 foot vertical in certain lighter soils. A minimum of 1½ feet horizontal to 1 foot vertical has been widely adopted. Although flatter slopes would be desirable in light soils, farmers are somewhat reluctant to give up the amount of land necessary for a completely stable slope situation. Thus many channels are constructed steeper than the optimum with the result that frequent repairs are necessary and erosion often occurs.

In the early years, many of the open municipal drains were dug with teams of horses pulling hand-operated scrapers. By the later 1920s, these had been mostly replaced with drag lines, which is the equipment still being used today. The earth excavated from the channel is deposited on adjoining land and is subsequently spread and levelled with a bulldozer usually to depths between 6 and 24 inches depending on location and circumstances. In recent years, the tendency in cropped lands has been to the shallower depths. Leveling excavated material is delayed where possible until the crops have been harvested from the adjoining land and the scheduling is undertaken as much as is practicable to avoid crop loss.

Brush and small trees can usually be pulled out by the dragline, with chain saws removing larger timber

and bulldozers assisting in stump removal. The timber debris is left for the owner's disposal or is piled and burned by the contractor. Pipe sections for culvert installations are usually supplied by the commissioner and placed and backfilled by the contractor.

Side-mounted back hoes have been developed in recent years for working on open drains. These can be driven along the drain bank while the side mounting allows work in the ditch beside the vehicle. While having certain advantages with respect to bucket control, this equipment does not have the versatility a dragline offers. New open channel construction on a large scale is sometimes suited towards the use of road scrapers, although this is not general.

Where rock and unstable soils such as muck are encountered special treatment is necessary. Weathered rock may often be removed by the use of a backhoe or bulldozer, however, solid rock must generally be removed by explosives. Unstable solids encountered in swamp and bogs usually require the use of timer mats to support the excavating equipment. In some instances excavation can only be effectively carried out during the winter with the assistance of frost. This type of work must sometimes be undertaken in more than one stage by partially excavating the channel in the first pass in order to dry out and stabilize the immediate area and then making subsequent passes until the channel dimensions are achieved.

Erosion control is an important consideration both in the design and the construction of open channels, particularly where the drainage works is to be located in lighter soil. Erosion can result from a variety of reasons including surface flow off adjoining lands and flow from tributary ditches or tile drains. The presence of a water-bearing layer below the ground surface through which ground water flows undermines and causes erosion of this layer and subsequent bank failure. Erosion can also be caused by flow with the channel where excessive velocity creates problems at turns and in the bottom and results in bank failure. Obstacles and debris in open channels can contribute to erosion by deflecting the flow into the channel banks.

Where erosion can be anticipated, it is best treated during the original construction of the drain. There are instances, however, where spot treatment is possible at a lesser cost than undertaking preventive measure over a large area. Erosion from surface flow off adjoining lands is generally treated by ensuring that the flow enters the channel at places where it can be properly protected by rubble, pipe

entries, or other suitable means, and this treatment usually involves some form of dyking. Erosion at the entries of tributary ditches or tile drains, or a combination of both, is of a localized nature and as such can be effectively treated. Protective walls of stone or some form of riprap may be used for channel entries where the erosion is not severe with a more sophisticated form being used where the situation warrants.

Tile outlets are usually protected by the installation of a rigid pipe that is sufficient in length to carry the water out into the ditch and that extends sufficiently into the bank for stability. This means can also be used for a great variety of open ditch discharge points. Where tile and open channels coincide, the entry works must be designed to handle both elements of flow and often requires careful design.

The erosion problem related to subsurface flow is very difficult to control except by some form of intercepting tile. This is usually very expensive and can only be justified where serious and progressive erosive conditions exist. Ditch-bottom erosion caused by excessive velocities of flow in a channel is also often expensive to effectively control. Reducing the gradients is the only control and can be done with weirs or check dams at intervals along the drain. These can be constructed from such materials as gabions, timber, or concrete and may involve sophisticated drop structures that require considerable design skill to contain the flow and absorb the energy generated by the water. Rubble or similar protection can be used effectively at sharp turns to control erosive effects. In some cases, the judicious use of vegetation can inhibit many types of erosion.

The stability and longevity of an open channel can be greatly improved if the bottom of the channel can be kept dry. There was a period during and before the 1930s when many drains were constructed with a tile sunk in the bottom of an open channel. These installations removed the moisture from the bottom of the drains greatly reducing maintenance costs and providing a better conductor for surface flow. Since the tile in these drain bottoms generally lacked adequate capacity for present day subdrainage, most of these installations have since been improved as open channels.

To a limited degree, equally effective channels that are deep enough to conduct subdrainage flow have been constructed with a small tile drain installed below the ditch bottom and taken to a sufficient outlet to keep the ditch bottom dry. Such an arrangement can be incorporated best either in a new channel or in a major enlargement to an existing channel, providing the relative elevations are favorable. The earth excavation can be carried out in two stages in these cases. First, the upper part of the channel can be constructed to a depth and width that is suitable for installing the small tile with a conventional trencher. Then the balance of the channel can be completed.

Some reference should be made to the ways vegetation can be controlled or removed from open channels. Newer and better chemicals and application

methods are being developed every year. Chemical control, however, involves problems of potential damage to adjacent crops and possible water pollution. Effective chemical sprays have been developed for cattails and approved for use by the Ministry of the Environment. There are also effective chemicals for use on willows and other forms of brush. Newly developed equipment and techniques have greatly reduced the dangers of spray drifting to adjacent areas. Accessibility is a matter of some importance, and drains that are located along roadsides are by far more convenient to treat with sprays.

Equipment has recently been introduced on the market in Ontario that incorporates a mowing bucket mounted on a sideboom vehicle. Experience with mowing machines is limited at present and the practicability of this type of equipment has not been proven.

Although chemicals and techniques for vegetation control are available and in use, there are not many townships with organized programs in operation. It is hoped that the recommendations included in this report will encourage these types of programs.

Construction methods are much the same for both municipal and private covered drains. The contractor generally distributes the tile or pipe for the scheme along the course of the run for municipal drains, whereas the farmer often does this job for private installations. The contractor then uses a tiling machine to excavate the trench along the desired route and to suitable grades. Clay or concrete tile sections are placed into the trench either manually or with a sideboom or other mechanical means. The tile are then blinded with top soil (or sod where practical) to hold them in place and protect them from stones in the balance of the backfill. The excavated material is then put back into the trench by a grader, bulldozer, or some form of equipment specially designed for the task. Tiling machines are available that undertake all these functions in one operation. Where tile drains are installed in sandy or otherwise unstable soil, it is good practice to wrap the joints with fiberglass sheeting, which allows water to pass through but filters out sand to a considerable extent. Plastic tiles can be wrapped with sheeting in the manufacturing plant. Polyethylene underlay is often used for stability in this type of soil.

A relatively new type of machine is being used to install plastic pipe tile. Instead of excavating a trench, placing the tile, and backfilling it, this new machine plows in the tile in a manner similar to that used for a telephone cable. Laser beam equipment is used to control grades. This method is most often used in the smaller sizes for private installations and requires special treatment where large stones are encountered. The Committee received complaints that sometimes contractors did not go back and treat such locations with resulting defects in the work. Tile drain inspectors expressed concern about this problem and also about the lack of an effective way to check grades for this type of construction. Manufacturers' representatives indicated to the Committee that

research was being undertaken on a recording device that would indicate on paper what was happening below the ground as the work proceeded.

The current methods for installing tile drains seem to be working reasonably well. Technological

advances in equipment and materials are being implemented which have improved construction and installation techniques at a fairly rapid pace. Licencing tile drainage contractors has improved the quality of the work, and manufacturers are developing quality standards for their various products.

XIII. THE APPEAL PROCEDURE

The Present System

Under The Drainage Act, appellate jurisdiction is exercised by three tribunals: the Court of Revision, the County Court judge, and the Referee.

The Court of Revision is established under Section 30 of the Act and consists of three or five members appointed by the council of the municipality. Under Section 31, the Court of Revision hears appeals by landowners from the engineer's assessment of their lands following adoption of the engineer's report by provisional by-law. The Court of Revision also hears appeals under Section 51 following reassessment of land arising from changed circumstances.

The County Court judge hears appeals under Section 33 from decisions of the Court of Revision and against the omission, neglect, or refusal of the Court of Revision to hear or decide an appeal. The judge's decision is final. The judge can also hear an appeal from the owner following the apportionment of an assessment which results after the subdivision of a parcel of land if the assessment is greater than \$200. Under Section 23, the judge has power to review the engineer's account on the application of the council of the municipality.

Under the Act, the Referee exercises broad jurisdiction, both appellate and original. He hears appeals on a wide variety of matters, some of which may be originated in his office that are not by way of appeal from some other tribunal. The office of the Referee is established under Section 66 of the Act, and he has all the powers of a Supreme Court judge under Section 67. His jurisdiction is not set out in any one part of the Act, but rather his catalogue of powers is scattered throughout a number of sections. The Referee's most important jurisdiction is found in Section 36 of the Act, under which a landowner or a public utility can appeal from the engineer's report on any of the following grounds:

1. That the engineer's report does not comply with the requirements of The Drainage Act;
2. That the benefits to be derived from the drainage work are not commensurate with the estimated cost thereof; and
3. That the drainage work should be modified on grounds to be stated.

Under Section 37, an appeal can be taken from the engineer's report where the report is to the effect that the drainage work is not required or is impractical or cannot be constructed under Sections 3 or 4 of the

Act. The decision of the Referee under Section 37 is final. Under Section 35, a conservation authority may appeal from the engineer's report on the ground that the works will injuriously affect a scheme undertaken by the conservation authority. The council of a municipality other than the initiating municipality can appeal from the engineer's report on a variety of grounds contained in Section 38 (2). Under Section 50, any such municipality can also appeal from a provisional by-law authorizing repairs, enacted by the initiating municipality. The appeal can be made on the ground that the amount assessed against the lands and roads in the municipality is excessive, or that the work provided in the by-law is unnecessary, or that the drainage works has never been completed through the fault or neglect of the municipality whose duty it was to do the work. Under Section 51, the council of a municipality liable for contribution to a drainage works may apply to the Referee on the ground of changed circumstances for permission to procure an engineer's report to vary the assessment. Any municipality served with a copy of the engineer's report obtained under this procedure may appeal to the Referee from the engineer's findings as to the portion of the cost of the drainage works for which the municipality is liable. Under Section 23 (4), the Referee can entertain an appeal from a County Court judge's decision on a review of the engineer's account if the account exceeds \$500.

Under Section 61, there are similar rights of appeal to the Referee on an abandonment of a drainage works. Sections 48 and 53 confer rights of appeal on a reassessment where insufficient funds have been provided for and appeal upon a reconstruction.

In addition to the strictly appellate jurisdiction conferred on the Referee, he is given some rather broad powers of a general nature that are usually exercised by ordinary courts in other cases. Under Section 67, the Referee may grant an injunction (an order restraining someone from doing something) or a mandamus (an order requiring someone to do something) in any matter before him. Section 76 of the Act provides that a court or judge before which an action is brought may order the action to be transferred to the Referee. Section 73 appears to confer the broadest powers on the Referee. It provides:

Subject to Section 76, applications to set aside, declare void or otherwise directly or indirectly to attack the validity of any petition, report of an engineer, resolution of a Council, provisional by-law or by-law relating to a

drainage works, as well as all proceedings to determine claims and disputes arising in respect of anything done or required to be done under this Act or consequent thereon, or by reason of negligence, or for a mandamus or injunction, **shall be made to and shall be heard and tried by the Referee**, who shall give his decision and his reasons therefor.

The jurisdiction of the Referee to quash a by-law is reinforced by Section 44, which provides that if an application to quash is not made to the Referee within three months after the passage of the by-law, the by-law is valid and binding according to its terms.

Notwithstanding the apparently all-encompassing nature of Section 73, the Committee is aware of the decision of the Referee in *City of Niagara Falls vs. The Township of Niagara* (June 1966). In this instance, the Referee decided that Section 73 does not of itself confer the right to apply to quash a provisional by-law, but that it is only a catalogue of matters in which the Referee has jurisdiction. If that is indeed the case, then the purpose of Section 73 is unclear and only adds confusion to the Act.

The Referee decided 57 cases from 1966 to 1973. A summary of some of the more important decisions of the Referee is contained in Appendix IV. The procedure to be followed in proceedings before the Referee is governed by Ontario Regulation 227. Needless to say, the procedure is complex and would be difficult to follow without a lawyer's assistance.

Section 83 of the Act provides a further right of appeal from a decision of the Referee, except as otherwise provided in the Act. One instance in which there is no appeal concerns a decision of the Referee under Section 37, where an appeal has been taken to the Referee from the engineer's report that the drainage work is not required or is impractical or cannot be constructed under Sections 3 or 4, in which case the Referee's decision is final. Under Section 83, the appeal from the Referee's decision is expressed to be to the Court of Appeal. By Section 17 of the Judicature Act, however, the appeal is now taken to the Divisional Court. The Divisional Court is a division of and is composed of the judges of the High Court of Justice (a branch of the Supreme Court of Ontario). It sits continuously in panels of three in Toronto and from time to time in London, Ottawa, Sudbury, Sault Ste. Marie, and Thunder Bay.

A New Appellate Procedure

While the present system has by and large served the public well for many years, the Committee believes that some fundamental changes in the appellate system are now necessary. The Act as presently drafted appears to have been written by and for members of the legal profession rather than for those whom it is designed to serve. A proposed appellant must attempt to determine the appropriate appellate forum and the grounds of appeal permitted to that forum. And if his appeal is to the Referee, he must attempt to comply with the procedural requirements of

Ontario Regulation 227, the existence of which he is unlikely to be aware. It is improbable that anyone could process an appeal to the Referee without a solicitor's assistance. Furthermore, it can take a good deal of time to dispose of such an appeal.

While many assessment appeals to the County Court judge are taken without legal assistance, they contain all the trappings of the Court system, which the Committee feels are unnecessary and inappropriate in such matters. During its deliberations the Committee received a large number of complaints that the proceedings on appeals to the County judge appeared to be weighted against the appellant who is not represented by counsel. The appellant finds himself in a completely unfamiliar environment and often finds the township solicitor and the engineer against him. The proceedings are conducted by a judge who expects the appellant to give technical reasons as to why his assessment is erroneous and to cross-examine the engineer on his evidence.

The Committee intends no criticism of the many County Court judges who faithfully attempt to carry out their duties under the Act and who, in the great majority of cases, do so in a fair and impartial manner according to law. Nor does the Committee intend any criticism of the present incumbent of the office of Drainage Referee, whose knowledge of drainage law and procedure is well known and who has served this Province well for many years. However, the Committee's basic premise is that the appeal procedure should be expedient, simple, easy to understand, and as informal as possible while maintaining fundamental justice and fairness. While the County Court judge and the Referee provide justice and fairness, they do not necessarily provide speed, simplicity, ease of understanding, or informality. The Committee believes that the latter factors require the institution of a completely new appellate system, which is outlined below and recommended for adoption.

Court of Revision

The Committee recommends that the Court of Revision be retained to entertain appeals from assessments determined by the engineer in his report. The Committee believes that it is desirable to retain a tribunal whose members are familiar with the local conditions prevailing within the particular area under consideration when the only consideration is the amount of money an individual is to be assessed for a proposed drainage works. Agricultural land owners are familiar with the Court of Revision and most persons expressed satisfaction with its operation to the Committee.

Ontario Drainage Appeal Tribunal

For the reasons outlined above, **the Committee recommends** the establishment of an Ontario Drainage Appeal Tribunal. The proposed composition and procedures of the Tribunal will be discussed later in this section. The jurisdiction that the Tribunal should exercise is discussed below.

In general, the Tribunal should exercise all of the

present appellate jurisdiction of the County Court judge and the Referee. The Committee has already made reference to the general jurisdiction of the Referee (which appears to be conferred by Sections 67, 73, and 76 of the present Act) to entertain claims for damages, grant mandamus and an injunction, and to quash by-laws. It is not appropriate that such jurisdiction be exercised by a provincially appointed administrative tribunal, and **the Committee recommends** that no reference to such matters be made in the amended statute. Those powers should be exercised by the ordinary courts.

Curiously enough, there does not appear to be any power conferred on any appellate tribunal under the present Act to entertain appeals from allowances granted by the engineer under Section 8. Notwithstanding this oversight, the Committee has been advised that some Courts of Revision and County Court judges have entertained appeals from allowances. It is not known, however, whether any challenge was made to the jurisdiction of those bodies to entertain such appeals. **The Committee recommends** that the redrafted statute provide for appeals from allowances to the Ontario Drainage Appeal Tribunal.

The Committee has already discussed (part VIII) its proposals for a modified petition procedure and the rights of appeal that will flow from such procedure. The Committee has recommended that in some cases any number of landowners should be able to initiate a request for preliminary studies prior to a formal petition. It is contemplated that in all cases an environmental assessment, and a benefit-cost analysis will be obtained, and in some cases a preengineering report. In those cases in which a preengineering report is obtained, 60 days will then be allowed for a valid petition to be raised and the local council will then decide whether the project should proceed. Certain rights of appeal will arise at the time that decision is made and others will arise when the engineer makes his final report.

In cases in which a valid petition is raised without the necessity of a preengineering report, a benefit-cost report and an environmental impact statement will be filed with Council at the same time as the engineer's final report. Council will make a decision as to whether or not to adopt the report, and all rights of appeal will arise at that time.

The Tribunal's jurisdiction should be specific and should be contained in one part of the Act to avoid confusion. For clarity, the rights of appeal to the Tribunal should be to entertain any of the following:

1. An appeal from any decision of a Court of Revision;

2. An appeal from the apportionment of an assessment following the division of a parcel of land where the assessment is greater than \$200 (see Section 19 of the present Act);

3. A review of the engineer's account (see Section 23 of the present Act);

4. An appeal on environmental grounds by the Minister of Natural Resources from a decision of the municipal council to proceed or not to proceed with the drainage works;

5. An appeal by the Minister of Agriculture and Food from a decision of the municipal council to proceed or not to proceed with the drainage works;

6. An appeal by a landowner in the area benefiting from the proposal as defined by the engineer from the decision of the municipal council to proceed or not to proceed with the drainage works;

7. An appeal by any landowner within the drainage area or by the Minister of Agriculture and Food from the engineer's final report on the grounds that the report does not comply with the requirements of The Drainage Act or that the works should be modified on grounds to be stated (see the present Act, Section 36);

8. An appeal by a conservation authority from the engineer's final report on the ground that the drainage works will injuriously affect a scheme undertaken by the authority (see Section 35 of the present Act);

9. An appeal from the engineer's final report by a municipal council other than the initiating municipality on the grounds presently contained in Section 38 (2) of the Act;

10. An appeal from a provisional by-law respecting repairs to a drainage works by a council of a municipality other than the initiating municipality on the grounds presently contained in Section 50 (1);

11. An appeal by a municipal council from the engineer's report on a variation of assessments for maintenance as to the portion of the cost of the drainage works for which the Municipality is liable (see Section 51 (3) of the Act);

12. Appeals on abandonment of a drainage works (see present Section 61 of the Act);

13. An appeal by a landowner or the Minister of Agriculture and Food from the allowances provided by the engineer's final report under Section 8 of the Act;

14. Appeals on improvement or reconstruction of a drainage works;

15. An appeal by a landowner from the refusal by a municipality to lend funds for tile drainage purposes pursuant to Section 3 of The Tile Drainage Act;

16. An application by a municipal council at any time to modify a drainage works on grounds to be stated;

17. Appeals under Section 48 of the Act.

In cases where a preengineering report is obtained, the Committee has provided for certain

appeals after the preliminary decision of a council to proceed with the drainage works, as it is preferable to determine such matters at that stage rather than incur the expense of a complete engineer's report and then determine such matters. In cases where a preengineering report is not obtained, and a project is proceeded with on the strength of a petition, a benefit-cost analysis and an environmental impact statement, the rights of appeal under items 4, 5, and 6 above will arise when the council decides whether or not to adopt the engineer's report.

Divisional Court

The Report of the Royal Commission Inquiry into Civil Rights stated that: "A right of appeal from a decision affecting civil rights is the best known insurance against the arbitrary exercise of power." While not suggesting that the Ontario Drainage Appeal Tribunal would exercise its power arbitrarily, the Committee nevertheless agrees with the general principle. Thus **the Committee recommends** that an appeal to the Divisional Court (a division of the High Court of Justice) be preserved. The jurisdiction of the Divisional Court, however, should be extended to include an appeal from any decision of the Tribunal. No decision of the Tribunal should be absolutely final. While the Committee anticipates that appeals to the Divisional Court would be rare, an avenue of appeal should be provided to preserve the rights of all parties concerned and to ensure that important questions can be determined by an appellate court.

Time Limits

The Committee has noted that the times limited for the taking of particular appeals under the present Drainage Act are many and varied. For example, a notice of appeal to the Court of Revision under Section 31 shall be given "at least ten days before the first sitting of the Court"; an appeal from the engineer's report under Section 36 shall be made "within thirty days after the mailing of the copy of the provisional by-law"; an appeal from a negative report of the engineer under Section 37 shall be made "within 21 days from the mailing of the notice . . ."; and an appeal by the council of a municipality under Section 38 shall be made "within six weeks after the report is sent to the Clerk."

The Committee recommends that uniform time limits be adopted for appealing which depend not on the nature of the appeal but rather on the character of the tribunal to which the appeal is taken. **The Committee recommends** that cases of appeal to the Court of Revision must be made at least ten days before the first sitting of the Court provided that, as now, the time can be extended in special circumstances. Cases of appeal to the Ontario Drainage Appeal Tribunal should be taken within twenty days after notice of the decision or action complained of has been given. A notice of appeal to the Divisional Court should be given within thirty days after the date of the Tribunal's decision. Both the Tribunal and the Divisional Court should be able to extend the time for appealing in special circumstances.

Composition and Procedures of the Tribunal

The character and procedures of the Tribunal established by legislation are of equal importance to the right of appeal. It is often of greater importance to the appellant to have access to an appellate body that is flexible enough to hear his case quickly, that is a reasonable distance from his residence, and that has a degree of informality so he will not feel completely overwhelmed by a procedure unfamiliar to him but that will nevertheless guarantee him a fair hearing. The Committee realizes that many of these matters cannot be provided for adequately in the legislation, but it nevertheless wishes to make some observations that will guide and assist those who will ultimately operate and administer the Tribunal.

The Committee considers the following general principles to be of prime importance in the operation of the Tribunal:

1. It must be expeditious and easily accessible;
2. It must be flexible as it will hear appeals throughout the Province;
3. It must be reasonably informal but nevertheless guarantee a fair hearing;
4. It must have the expertise to handle questions of an assessment, engineering, or legal nature as they arise.

The Tribunal should be established under the Act and should have the jurisdiction that has already been discussed. The members should be appointed by the Lieutenant-Governor-in-Council. **The Committee recommends** that the legislation not contain a maximum number of members that can be appointed as it may be necessary to appoint more from time to time as the workload increases.

It is impossible to predict at this time the number of cases that the Tribunal will hear annually. The Drainage Referee heard only 57 cases from 1966 to 1973, but other cases might have been taken to the Referee had it not been for the expense, time, and complications involved. The Committee has been unable to determine the number of assessment appeals in drainage matters taken to County Court judges. It should be borne in mind that the Tribunal's jurisdiction will be slightly broader than that of the County Court judge and the Referee and that more appeals may result. A sufficient number of members should be appointed in various parts of the Province to ensure that an appellant will be able to have his appeal heard as expeditiously as possible. The members need not be full time and their services can be utilized as required.

The chairmen of the Land Compensation Board and the Assessment Review Court appeared before the Committee during its deliberations to outline the operations of their Tribunals. The Committee is grateful to those gentlemen for taking the time to appear and for giving it an insight into the workings of

two tribunals which currently operate under Ontario legislation.

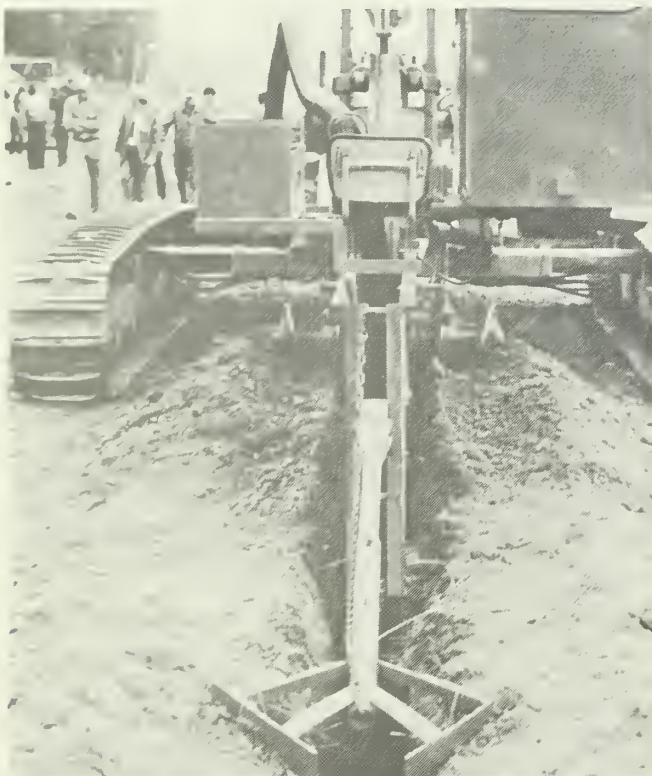
The Committee was advised by the Chairman of the Assessment Review Court that that Court is presently composed of 350 members, that it disposed of 170,000 assessment appeals in 1973. The Committee was provided with a copy of a manual that had been prepared for the use of the Assessment Review Court members. The manual, which outlines the proceedings of the Court, is too lengthy to reproduce in this Report, but it is sufficient to say that its tenor stresses a degree of informality but requires a fair hearing in all respects. A Court member is encouraged to ask questions of both the assessor and the appellant, particularly where the appellant is not represented by a solicitor and has not properly presented his case. Of course, the Assessment Review Court is subject to the Statutory Powers Procedure Act (as would be the Ontario Drainage Appeal Tribunal) and must follow the minimum rules of procedure as set out in that Act.

The Chairman of the Assessment Review Court pointed out that under Section 52 (7) of the Assessment Act, where value is a ground for complaint, the assessor must give his evidence first on the ground that he has knowledge of all the factors that compelled him to arrive at the value in question. In agreement with this principle, **the Committee recommends** that on an appeal from the Court of Revision or on an appeal to the Tribunal directly by a landowner from allowances granted by the engineer under Section 8, the engineer should be required to give evidence first.

With the approval of the Lieutenant-Governor-in-Council the Tribunal should be given power to make

rules to govern its own procedure. However, **the Committee recommends** that such rules should be as few and as simple as possible. Since it is likely that many appellants will not be represented by solicitors, the appellant should be required to do a minimum of paperwork. It should be stated in the statute itself that the report or decision appealed from should inform the appellant of the time required to appeal, of where the notice of appeal should be sent, and of what it should contain. Preferably, a form of notice of appeal should be appended to the report or decision. The appeal should not be defeated merely because the grounds of appeal are not stated as accurately as they might be. The Committee realizes, however, that it is unfair to expect a respondent to prepare a response to the appeal and to proceed to the hearing if the grounds stated are so vague that they do not set out a clear basis for complaint. This would particularly be the case where an appeal is taken on some technical aspect of the engineer's report. **The Committee therefore recommends** that the Tribunal should have the power either of its own motion or on the application of any party to require a statement of particulars of the grounds of appeal. However, this power should not be used as a tool of oppression or for the purpose of delay.

Decisions of the Tribunal should be required to be filed with the Ministry of Agriculture and Food as well as the immediate parties to the appeal. Where written reasons are given, the Ministry should make every effort to make them available to interested persons on request. The Committee feels that the periodic publication of an index to decisions of the Tribunal would be of great assistance in making the public aware of the policies of the Tribunal.



Plastic tile installation by trenching.



Clay tile installation by trenching.

XIV. FINANCIAL ASSISTANCE

The policy of financial assistance to municipalities for drain construction has been in effect for a long time and recognizes the continuing need to bring potentially productive agricultural land into full production. During the immediate post-war period, legislation entitled The Provincial Aid to Drainage Act authorized the government to assist municipal drainage schemes by assuming 20 percent of the cost if the total cost exceeded \$10,000. In 1948, the Report of the Select Committee on Farm Drainage noted that the limitation of grants under this Act to those works costing over \$10,000 was a bar to some drainage schemes. That Committee recommended that the work would be expedited and more encouragement given if the minimum cost for grant eligibility were reduced from \$10,000 to \$5,000 and if the grant were increased from 20 to 30 percent. The eligibility limitation on the drain size was reduced as a result of this recommendation from \$10,000 to \$5,000, but the grant was left at 20 percent.

In 1950, a Select Committee on Conservation reported that "It appears that there is a real need for greater provincial assistance that would accelerate soundly conceived drainage projects not only in the east and the north but on any lands where the agricultural potential is relatively high. Provincial assistance must of necessity be more generous in the territorial districts and in the areas lacking any municipal organization than in the well-settled and highly developed sections of Ontario." They therefore recommended that provincial subsidies on drainage works be raised to 33½ percent in the counties, 66⅔ percent in the territorial districts or provisional counties, and up to 80 percent in the unorganized areas. These recommendations were accepted and taken into legislation, forming the present grant structure under The Drainage Act, Section 64(2) and 65 (2).

Aid to farmers who wanted to underdrain their fields was first made available in 1878. The legislation at that time allowed a municipal council to issue debentures for not less than \$2,000 and not more than \$10,000 for the purpose of lending money to farmers to install tile drains. The amount to be loaned to any individual farmer was not to exceed 75 percent of the total estimated cost of the work and no sum would be loaned which would require a greater taxation rate than 3 cents per dollar on the value of the lot proposed to be drained. In 1885, the municipal council could issue debentures under The Tile Drainage Act to a maximum of \$10,000 at any one time. In 1887, the interest rate on loans made under this Act was reduced from 5 to 4 percent. At the same time, a top limit of \$350,000 was set for total purchase

of tile drainage debentures by the Province. In 1914, the interest rate under The Tile Drainage Act was changed from 4 to 5 percent and municipalities' borrowing limits were raised from \$10,000 to \$40,000. The total amount which could be borrowed by an individual remained at \$1,000. Further amendments were made 9 years later, increasing the limit on municipal borrowing to \$200,000 and the maximum level of provincial expenditures to \$2,000,000. The maximum to be loaned to any individual was raised to \$2,000 for each 100 acres in 1920, and the provision that the amount to be loaned to any individual was not to exceed 75 percent of the total cost of the work was added in 1928. Also, in 1928, the maximum allowable amount of provincial debenture purchases under The Act was raised to \$3,000,000.

The rate of interest under The Tile Drainage Act was reduced again from 5 to 4 percent in 1937 and was further reduced to 3 percent in 1943. The Select Committee on Farm Drainage in 1948 recommended that the maximum amount which could be borrowed by an individual be raised to \$3,000 per 100 acres. This recommendation was accepted and the necessary amendments to The Tile Drainage Act were enacted in 1949.

During the 1960's, a number of changes in The Tile Drainage Act affected the amount municipalities were permitted to borrow and also the total amount the provincial government could invest and the terms of the loan between the municipality and the farmers. The Act of 1971 made it clear that there was no longer to be a maximum amount which any municipality could borrow except that the municipality could not issue more than one debenture each month. This debenture, however, could combine amounts to be loaned by the municipality for any number of drainage works. The amount of each debenture issued could not exceed either the amount of the loans for which the debenture was issued or 75 percent of the total cost of the drainage work. The interest rate on debentures was to be set from time to time by the Cabinet rather than by legislation. The limit on the total amount of money that could be invested in tile drainage debentures by the provincial government was also removed. The total amount loaned to any one farmer was not to exceed either the amount applied for or 75 percent of the total cost of the works.

Municipalities and farmers in Ontario have been quick to take advantage of the available grants and favorable interest rates to provide themselves with improved land drainage. The chart in Figure 1 indicates that annual debenture purchases under The Tile Drainage Act increased from \$1,400,000 in 1962

to a high of \$6,000,000 in 1971-72. With the recent increases in the market value of cash grains, total purchases of tile drainage debentures by the Province were reported to be over \$8,000,000 in the fiscal year 1973-74.

Amounts granted under The Drainage Act have exhibited a similar pattern although not quite as abrupt as the debenture purchases (Figure 1). The total amount was about \$750,000 in 1962, followed by a falling off in the amount until the grant expenditures started to climb in 1966-67. The amount reached a

peak of \$3,500,000 in 1971-72 but was followed by a sharp drop in drainage activity, with grant expenditures amounting to less than \$2,000,000 in 1972-73.

The Committee received requests during its deliberations that grants under The Drainage Act and amounts available under The Tile Drainage Act should be increased so that additional agricultural land could be properly drained. The Committee's recommendations with regard to future financial assistance under both these Acts is contained in parts XV and XVI of this report.

XV. THE DRAINAGE ACT, R.S.O. 1970, CHAPTER 136

Problems

As outlined in the part (II) of this report dealing with the history and development of drainage law, the present Act is the result of five separate pieces of legislation being amalgamated by a special advisory committee in 1961-62. While that committee did a commendable job of consolidating drainage legislation into one statute, a comprehensive reading of the Act reveals that many inconsistencies and illogical sequences make it very difficult to understand not only for laymen but even, in some cases, for the lawyers and professional engineers involved.

The engineer in The Drainage Act is important because he is appointed under the Act's authority. Because he makes judgments and decisions that have considerable impact on ratepayers and others, the Drainage Referee has described him as semijudicial in his duties. In reading this Act, it is difficult to discern clearly and concisely the engineer's duties and functions. For example, Section 8 of the Act almost wholly deals with what the engineer shall include in his report. There are ten subsections to Section 8, with all except Subsection 3 using the phrase "the engineer in his report." Subsection 3 deals with the powers given to a local municipality for assuming by by-law, as a charge on the funds of the municipality, the whole or such part of the cost of construction, improvement, and maintenance of bridges and culverts rendered necessary by a drainage works which crosses any public road within the municipality.

A close reading of the Act reveals other small peculiarities. For example, there is reference to lateral drains in Sections 17 and 62 (2), but nowhere does the Act define lateral drains. Yet the engineer is given specific instructions to indicate the assessment of the cost of lateral drains in his report. Practising engineers have reported to the Committee that their view is that lateral drains are considered to be drains which begin and end in one parcel of property and that since these drains serve only one parcel, they are not entitled to grants and are therefore excluded under Section 62 (2).

Section 7 (1) of the Act permits a municipality to have the engineer make one report with respect to two or more petitions in adjoining areas, and Subsection 2 refers to the engineer appointed. It is really not clear whether the engineer appointed in Subsection 2 is the engineer referred to in Subsection 1. Again, practising engineers have reported to the Committee that they understand Subsection 2 to mean the engi-

neer appointed under Section 3 of the Act and not the engineer appointed under Section 7 (1).

The Committee puzzled over the wording of Section 51 (4) which refers to "any owner of land and any ratepayer in a municipality in which roads are assessed." The Committee concluded that this phrase means that any ratepayer, even though living miles from the drain, may appeal from the assessment. It is difficult to know how any ratepayer in the municipality receives notice of such an assessment unless he is actually involved in the drain. It is the Committee's feeling that the council itself should be protecting the interests of other ratepayers in cases like this. In any case, the road superintendent should be the advocate for ratepayers in this regard and it is really not necessary for the Act to make the distinction.

The preceding discussion includes only a few of the examples of what is puzzling and illogical in the present Drainage Act, leading the Committee to believe that a concerted effort be made to construct the Act so that it reads clearly and logically from beginning to end.

During its study of this legislation, the Committee was made aware of an address to the Institute of Public Administration of Canada by Martin L. Friedland, Dean of the Faculty of Law of the University of Toronto, in February 1974. Dean Friedland made a statement with which the Committee is in total agreement: "The state has an obligation to ensure that its laws are available in understandable fashion to laymen." The Drainage Act by its very nature, deals with the rights and properties of citizens. Dean Friedland also says that "citizens should be able easily to ascertain their rights and obligations." The Committee's view is that The Drainage Act in its present form does not allow citizens easy access to the determination of their rights and obligations. A farmer who becomes involved with The Drainage Act at present must consult a lawyer to determine the totality of his rights and obligations. Dean Friedland does not agree with this situation and goes on further to say that "it is surely in principle wrong to have the law in such a form that only lawyers can find and interpret it."

This Committee wishes to draw to the attention of the authorities concerned that it is fervently hoped the finished product of rewriting The Drainage Act will be presented in a logical, lucid, and clear manner so that ordinary citizens, engineers, and township councillors can use the Act efficiently with little or no difficulty and with a minimum of costly and time-consuming litigation before the courts.

Recommended Amendments

While the Committee has dealt with proposed major changes in legislation in preceding parts of this report, **the following are recommended as amendments to certain sections of the Act:**

Definitions

1. Benefit should be defined to mean the increased worth to any lands, roads, buildings, or other structures from the construction, improvement, repair, or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water or any other advantages relating to the betterment of the properties, whether or not they are similar in nature to those listed.

2. The present Act defines an engineer as one registered as such under the Professional Engineers Act or a surveyor registered under The Surveyors Act. In light of present day practise, where many engineers and surveyors are working in registered partnerships or in limited companies, it is incumbent that the definition be changed to provide for such practise. It is recalled that a case was successfully appealed to the Drainage Referee when a municipality appointed a corporation rather than an individual engineer. The Referee, hewing strictly to the legal definition, held that this appointment was invalid. **Therefore the Committee recommends** that the definition of an engineer be as follows: Engineer shall mean an engineer registered as a professional engineer under The Professional Engineers Act or a surveyor registered as an Ontario land surveyor under The Surveyors Act or a partnership, association, or corporation which holds a certificate of authorization under either of these Acts, providing that in the case of a partnership, association, or corporation, the person responsible for the undertaking is registered as a professional engineer or an Ontario land surveyor.

3. Drainage works should be defined as an installation constructed by any means involving the improvement of a stream, creek, watercourse, and includes installations necessary to control the water table or level on any lands or to regulate the level of the waters of a reservoir, lake, or pond and includes a dam, embankment, wall, pumping installation, protective works, or any combination thereof.

4. The Committee has decided that the definition of public utility should be extended in the Act to include railways and public roads under the jurisdiction of any municipality or the Province of Ontario. The reasoning and justification for this decision is contained in the part of this report dealing with all types of barriers to drainage construction.

5. The concept of injuring liability has been rendered obsolete over the years, since practising engineers have usually assessed this type of liability, if there were any, along with their assessment of outlet liability. The Committee accepts this as a proper practise and **recommends** that injuring liability be deleted

from the definitions in the Act and removed as a concept in the engineer's assessment responsibilities (Section 16 (2)).

SECTION 2. This section provides for mutual agreement drains whereby two farmers who desire to construct or improve a drainage works and are willing to pay the cost thereof enter into agreement. The section provides for the details which shall be covered in the agreement. It also provides that this agreement may be filed with the clerk of the local municipality or a copy may be registered in the proper registry or land titles office. While the Committee agrees that this is an admirable part of the Act and is an arrangement that should be available to farmers entering into such agreements, the Committee still feels that the permissive nature of the section nullifies its usefulness. The Act does not require that any agreement be entered into and goes on to say that, if an agreement is entered into, it does not necessarily have to be filed with the clerk or registered in the registry office.

The Committee recommends that, to avoid difficulties which have been reported in hearings and elsewhere, a copy of the agreement should be required to be registered in the proper registry or land titles office, where there is a mutual written agreement entered into by two or more owners of land regarding the construction or improvement of a drainage works. The Committee feels that requiring such registration will protect future purchasers from buying land where an agreement exists without their knowledge.

SECTION 4 (4). Some confusion has been reported as to the meaning of the phrase "the point of commencement of the drainage works." Subsection 4 is concerned with the assessment of land adjacent to the drainage works, and the Committee would point out that in the context of the whole subsection, the only reasonable interpretation of the phrase is that it means the upstream end of the works rather than its point of outlet.

SECTION 4 (9). Award ditches under the former Ditches and Watercourses Act must be maintained by the municipality in accordance with the award until such time as the ditch is brought under the provisions of The Drainage Act. The procedure for such transformation should be made clear.

SECTION 6. Authority is given for the engineer to enter upon private property in the performance of his duties. The Committee notes the lack of uniformity in Subsection 1, which refers to "the engineer and his assistant," and Subsection 2, which refers to "the engineer or any of his assistants." It is suggested that the second phrase be applicable to the whole section.

While agreeing that such authority and right must be given to the engineer under the Act, the Committee is agreed that, in carrying out his duties and using this authority, the engineer should be restricted to the extent that he should not enter any property until the owner is notified by the clerk that survey work may be anticipated on his property.

The Committee notes that the engineer and his staff are given this right and authority and that the drainage superintendent is given similar authority. It was drawn to the Committee's attention, however, that contractors engaged in constructing a drain have sometimes been refused entry. **The Committee recommends** that this obvious omission be corrected.

The Committee also recommends that the fine should be increased to \$200 from the amount stipulated in Subsection 2 of Section 6.

SECTION 7. Comprehension and interpretation difficulties arise in this section because of poor drafting and wording. It has already been noted that there is some question whether the phrase "the engineer appointed" in Subsection 2 refers to the engineer in Subsection 1 or whether it refers to the engineer appointed by council as a result or petition in Section 3. Again, the Committee is not clear as to why Subsections 3 and 4 are contained in Section 7 when they obviously deal completely with matters not pertinent to Subsections 1 and 2.

SECTION 8 (9). While most of Section 8 is dealt with elsewhere in this report, the Committee wishes to make some particular observations about Subsection 9, which permits an engineer to compensate an owner of low-lying land in lieu of taking a drain to a sufficient outlet. The Committee feels this principle should be continued but is concerned that an unsuspecting buyer could purchase lands in the dry season without being aware that a drain has been specifically constructed so that the lands will flood and that the present owner has been appropriately compensated. Accordingly, **the Committee recommends** that where a person has been compensated in lieu of the drain being taken to a sufficient outlet, a copy of the by-law be required to be filed in the appropriate registry or land titles office. A registrable description of the property affected must also be filed in such cases.

SECTION 11. This section deals with interprovincial drainage works from Ontario into adjoining provinces or vice-versa. Neither the Ministry of Agriculture and Food nor the Committee is aware of any agreement which exists under this section. During the Committee's hearings and in reviewing the submissions, no comment was made on this subject by any group or municipality. Late in its deliberations, however, the Committee did receive a delegation from eastern Ontario, where there was a problem with a drain which had been constructed in the Province of Quebec and which, in order to fulfill its proper function, should have been continued into the Province of Ontario. The delegation wanted to know the proper procedure for accomplishing this.

The Committee recommends that a situation like this should be resolved by using the procedure outlined in Section 11. However, the agreement should not cover only one specific drainage works. It should be rather a blanket agreement by which the two governments set out the procedures and responsibilities

of each government in cases where drains cross provincial boundaries. Thus subsequent drains of this type could be dealt with by the administering officials rather than by drawing up ministerial agreements for each case. The Section should be amended to permit such blanket agreements.

SECTION 12. The Committee is agreed that the drainage commissioner should be given a greater role in the construction and maintenance of drainage works. Accordingly, part X of this report deals fully with this subject.

SECTION 19. This section deals with the problem of changing assessments when the land has been subsequently divided into different parcels. While the Committee was not really concerned with the provisions of Section 19 in this regard, it was felt the requirement that an engineer should be involved was perhaps unnecessary in some cases. **The Committee agreed to recommend** that where the owners can mutually agree on the amount they should pay after the land is subdivided, an engineer should not be required, providing the township revenues are not thereby reduced in any way.

In discussing this section, the Committee was made aware of the possibility of future buyers being unaware of drainage taxes when purchasing land. The forms presently used as tax certificates that lawyers obtain when involved in conveyancing of property are not required to and do not as a rule show the drainage taxes arising from construction of a municipal drain or the tile drainage debentures registered against the property. These taxes are discernible to a buyer only if it is quite evident to him and to his lawyer that drainage taxes are likely in that particular area.

Section 526 of The Municipal Act (R.S.O. 1970, Ch. 284) provides for the issuance of a tax certificate by the collector, but no form is provided or details set out. Section 549 of the same Act provides for the issuance of a certificate of tax arrears and a form of certificate is provided. Neither case allows for drainage taxes or tile debentures.

The Committee recommends very strongly that for the buyer's protection, statements or certificates of taxes or statements of tax arrears set out all the charges due on the property, including amounts due on municipal drainage and amounts due on borrowings under The Tile Drainage Act. The Township of Enniskillen in Lambton County provides a certificate to prospective purchasers on a form which the Committee agrees is quite adequate for this purpose. The items tabulated on the form include:

1. Township and County rate
2. Education
3. Fire Protection
4. Municipal Drainage
5. Dog Tax
6. Water Rates
7. Lights
8. Telephone

9. Tile Drainage Loan (maturity)
10. Miscellaneous
11. Total Current Taxes

The Committee believes that such a statement would comply effectively with the recommendation above.

It also has been brought to the Committee's attention that the period from the time of the third reading of the by-law to the time the amount payable by a land-owner for drain construction costs is actually placed on the tax roll could extend up to two years. During this time, a prospective buyer might purchase a property without knowing that a drainage assessment is pending. To remove this hazard, **the Committee recommends** that the tax rolls be amended immediately after the by-law is passed by third reading, to indicate the fact that a drainage assessment is pending.

SECTION 20 (1) In the interest of brevity and clarity, the Committee feels Subsection 1 should be written into two subsections since two situations are involved. One situation is where an owner of land subsequently connects with a drainage works, and the other is where the nature and extent of the use of the drainage works is substantially altered. The Committee feels that it would be simpler and easier to read if these two subjects were dealt with in two separate subsections rather than in one complicated subsection as now.

SECTION 22. This section deals with the matter of filing the engineer's report with council and places a six-month time limit for such filing after the date of the engineer's appointment or within such time as may be extended by council. It has been reported that this provision is not always adhered to. Because of his work load, the engineer in some cases is not always able to produce his reports and surveys in the six-month time period allotted, and there is usually tacit understanding between the engineer and the council as to when the report will be filed. It also has been reported that councils do not always make formal extensions of the time limit as required under this section. The Committee considered amending the section to conform with reality but felt these limits would continue to be necessary in some areas of the Province. The Committee therefore concluded that no change was required.

However, the Committee feels that Subsection 2 is not strong enough for its purpose and suggests a clause be added indicating that the engineer should be given notice that he will forfeit all claims for compensation unless the report is filed within a specified time limit, not to be less than 30 days.

SECTION 24. This section requires some amendment in the interests of clarity, but no major change is required. Subsection 1 requires the council of the initiating municipality, if it intends to proceed with the work, to forward a copy of the engineer's report to the clerk of every other municipality in which lands or roads are assessed for the works and to conservation authorities, railways, public utilities, and the Minister

of Lands and Forests where land under his jurisdiction is affected. The reference to the Minister of Lands and Forests should be replaced by the Minister of Natural Resources in every case and the Minister of Agriculture and Food should be added. The phrase "if it intends to proceed with the drainage works" only adds confusion, since the council normally would not have even considered the report at the time copies are sent out. The subsection should therefore be amended to simply provide that the clerk shall send copies of the report to those agencies listed. The agencies should also be notified of the date on which the report will be considered by council.

Subsections 2, 3, and 4 provide that affected parties shall be sent notices which contain information such as the assessment and the date on which the report will be considered. Subsection 5 also requires that a copy of the report shall be forwarded with each notice. It has been suggested that this procedure can be expensive and that it provides some duplication. However, the Committee feels that affected persons should be entitled to a copy of the full report so that there will be no misunderstanding of what is involved. **The Committee therefore recommends** no change in this respect.

Subsection 6 provides that the date of the council meeting at which the report will be considered shall be not less than 10 days after the required notices are mailed. It has been drawn to the Committee's attention, however, that the consideration of some reports has been unduly delayed because the notices and copies of reports have not been sent out for months. **The Committee therefore recommends** that the clerk be required to forward all the required notices and copies of reports within 20 days after the engineer's report has been filed and that Subsection 6 be retained in its present form.

The Committee received complaints concerning difficulty in notifying large corporations. Notices have been sent to head offices in distant locations without provoking any reply. The engineer will now be required to be in touch with major corporations and utilities at the time he is preparing his preliminary or final report, and this problem should be alleviated. The clerk should simply send the notice to the head office of the corporation unless otherwise notified in writing. If the corporation does not wish to take advantage of its right to make representations, the council ought not to be concerned.

SECTIONS 25 AND 26. These sections deal partly with a petition under the present Act. The Committee feels that the modified petition procedure suggested in this report will clarify some of the problems that became evident in considering these sections, especially Section 26. The problems revolve around the withdrawal of petitioners' signatures and the penalty clause in Section 26 (2). The Committee feels that the modified petition procedure will to some extent remove the possibility of last-minute withdrawals and that the penalty is unjustified and should be deleted.

SECTION 28. Council is given the right to refer the report back to the engineer for reconsideration if it appears there may be errors in his report. A referral back is normally time consuming and costly, and the Committee wishes to make two recommendations to improve this situation.

Errors by the engineer in calculating costs and allowances can sometimes be resolved at the time the report is considered. Information frequently is presented at that time which can reasonably dictate modification of the proposals. To expedite projects in cases where all present, including the council and the engineer, are satisfied that the modifications or amendments are proper, **the Committee recommends** that the report need not be referred back to the engineer. Instead, **the Committee recommends** that it be adopted "as amended" and that the engineer file an amended report clearly outlining the changes that would be included when forwarding the by-law. This will ensure that all concerned are aware of any changes made at the report's adoption which would be subject to appeal.

A second situation arises when the necessity for changing the engineer's report regarding the design and structure of the work becomes apparent after the by-law has been finally passed. In such cases, the council should have the right to apply to the Ontario Drainage Appeal Tribunal at any time for an appropriate amendment to the report. (See Appeal Procedure, part XIII of this report.)

SECTION 29. The possibility of additional duplication appears in sending copies of the provisional by-law to other municipalities. The Committee feels that there is room in this procedure for eliminating costs and therefore **recommends** that only the facts of the by-law dealing with finance, etc. be sent to neighbouring municipalities and landowners, without necessarily repeating what has already been submitted through the original distribution of the engineer's report in Section 24(5).

SECTION 41. This is a long complicated section which covers many items that are not all related. This section should be split after Subsection 3.

The Committee feels the marginal notes which refer to a "special assessment" that is not mentioned in the body of the Act tend to confuse readers and persons involved in administering the Act. It should be made clear, perhaps, that drainage assessments are special assessments, and then it would be proper to so designate them. Subsections 2 and 3 do not speak of special assessments whereas the marginal notes do.

Subsection 2 deals with the responsibility of each local municipality to pay the assessed amounts to the initiating municipality. The Committee points out that there are instances where an adjoining municipality might be permitted to pay the amount assessed in a lump sum and charge this amount to its general funds rather than calculate and pay a large number of very small assessments. The Act should provide for this

possibility and allow the decision to be made by the council of the municipality concerned.

The Committee recommends a change in thinking in the present Subsection 4 of Section 41, starting with a change in the \$25 figure in this subsection to \$50 having regard for present day values. This subsection provides that where assessments are levied on small parcels of land within the municipality's limits, the local council may provide that the assessments shall be paid out of the municipality's general funds. As a general principle **the Committee recommends** that where lands within a municipality are liable for assessment, the council may provide further that the engineer may designate in his report the affected area or areas and set out a block assessment on these lands and assessments on streets and roads. Such block assessment shall then be recovered by a levy against the ratable property in the designated area, and the assessment on streets and roads shall be recovered by a levy on the general rate of the municipality. If this recommendation is adopted, there would necessarily be changes in the section of the Act that deals with issuing notices regarding drains.

Subsection 6 provides complications in both interpretation and application. The phrase "specially assessed" is used in this subsection and again it is not clear what is special about this assessment. This subsection makes it clear that when lands normally exempt from taxation are assessed for drainage purposes, the assessments must be paid by the municipality imposing them, except where they are imposed on land occupied by churches or institutions of learning or lands owned by a school board. In the latter cases, the assessments are paid by the owners of the land. During their construction, many drains pass through lands exempt from taxation (for example, military installations, airports, provincial parks, lands owned by the county or township, etc.).

The Committee feels that this subsection is somewhat unfair to the township imposing the assessments. The Committee believes the principle should be that those who benefit from a drain should be assessed and pay that assessment regardless of their tax status. It is recognized that this principle is difficult to enforce on lands owned by Canada, but it is the Committee's belief that where a drainage assessment is made against lands owned by a county (for example, a county forest), the assessment should be accepted by and paid for by the county.

SECTION 44. Under the present provisions of Section 44, an application to quash the by-law must be made to the Referee within three months after its passage. Otherwise the by-law shall be deemed to be valid and binding. The intent of the section is obvious: those who wish to attack the by-law's validity should have a reasonable opportunity to do so, but the council should be able to rely on the by-law after a reasonable time has passed. However, since the Committee has recommended that the Office of Referee be abolished, the reference to the Referee in this

section should be removed so that applications to quash will be made to the ordinary courts.

SECTION 45. A municipality is given the right in this section to sue for damages to a drainage works. Section 7 (4) provides for the conviction and fine of anyone destroying bench marks or levels. Section 58 also provides for penalties to anyone who obstructs or injures or destroys a drainage works. Section 55 sets out the council's or drainage commissioner's authority in removing obstructions from drainage works. Rather than have these provisions scattered through various sections of the Act, it appears to the Committee that they should be brought together properly and dealt with under one heading — possibly damage or obstruction to drainage.

SECTION 48. This section is important in that it deals with raising funds when the engineer's estimate is too low. Where insufficient funds have been provided and the works are within one municipality, the council may simply pass an amending by-law and issue new debentures (Subsection 1). However, where the works are in two or more municipalities, an engineer must be appointed to examine the works and make a report with an estimate of the cost of completion (Subsection 2). The council of any municipality may appeal to the Referee as to the improper expenditure or illegal application of the money. It should be noted that this section applies only to projects which have been completed or commenced.

The Committee is of the view that some basic changes in this section should be made. If, before construction has commenced, it appears that the actual cost of the drain will exceed the original estimate by 33⅓ percent or more, **the Committee recommends** that Council must obtain the approval of a majority of the owners of properties within the drainage area, or owners of 60 percent of the acreage within the drainage area, before proceeding with the work. Subsection 2 should be amended to remove the requirement that an engineer must be appointed where two or more municipalities are involved. It should simply be provided that the initiating municipality may pass amending by-laws to raise additional funds, and other municipalities involved shall forthwith pass amending by-laws to raise their portions of the increased cost.

The Committee also recommends that, within 30 days after completion of any drainage works, the engineer and the drainage superintendent should be required to file a statement with the council which contains a summary of the matters which cost more or less than the original estimate, the reasons for the increase or decrease, and statement of how the monies were spent. The clerk should be required to forward a copy of the statement to the other municipalities involved, if any, every ratepayer on the drain, and the Minister of Agriculture and Food.

SECTION 51. This section provides that the council of a municipality liable to contribute to the maintenance of a drainage works may apply to the

Referee for permission to appoint an engineer to make a report varying the assessment for maintenance on the ground of changed circumstances. If all the lands are within one municipality, the Referee's permission is not necessary. The Committee feels the principle of the section is sound, but **recommends** that the provision providing for an application to the Referee be repealed so that it is no longer necessary to gain the permission of some other body to secure an engineer's report. Of course, the normal appeal procedure would apply.

SECTION 52. Where a drainage works is to be repaired or improved without the report of an engineer but on the recommendation of the Drainage Superintendent, the financial limitations **the committee recommends** should be 20 percent of the original cost or \$2000 whichever is the greater.

SECTION 60. This section prohibits pollution of drains by any liquid material or substance other than drainage water. It was represented to the Committee that the new technology in sewage disposal should permit the discharge of effluent into a drainage works, but the Committee feels that the requirements in Subsection 1 of Section 60 are sufficient. If manufacturers of this type of new technology are able to obtain the necessary approvals, as are at present required, they should proceed through the townships for the necessary by-laws as set out in Subsection 1. The Committee feels strongly about this section and **recommends** that the fines on summary conviction should be a minimum of \$100 in the first instance and \$500 on second and subsequent offences.

SECTION 62. It recently has been determined for the purpose of this section that farms owned by the A.R.D.A. Directorate of Ontario are "lands owned by . . . Ontario" and therefore that drainage assistance grants may not be made as provided for in this section. In calculating the amount of grant to be paid, the assessments against lands owned by Ontario (including A.R.D.A.-owned farms) are deducted.

These assessments, however, are paid in full by the Municipal Subsidies Branch of the Ministry of Treasury, Economics and Intergovernmental Affairs on behalf of A.R.D.A. similar to assessments on provincial highways, institutions, or installations owned by the Province.

This results in a peculiar situation. A farmer who leases and works a farm owned by A.R.D.A. has the drainage assessment against this land paid in full, while a farmer on his own land must pay at least ⅓ of the drainage assessment in the eleven eastern counties of Ontario and ⅔ of the assessment in the rest of the Province.

While it is recognized that A.R.D.A. regards these assessments as capital improvements and that the assessments are added to the price to be paid when and if the farmer exercises his option to buy, it is still an immediate benefit available to one group of farmers and not to others.

The Committee recommends that this anomaly be removed by making it clear that lands owned by A.R.D.A. are not to be considered as lands owned by Ontario for the purpose of calculating drainage grants.

SECTION 64. The Committee is aware from its research on costs and from the Ontario Farm Drainage Association's brief that the availability of 66⅔ percent grants on drainage works led to a volume of construction that was difficult to cope with and also led to increased costs and the quick exhaustion of available funds. This caused problems in the drainage industry for contractors, manufacturers, and suppliers. Nevertheless, the quality of the drainage works constructed during this period was high, and the Committee is confident that much of the additional grant money was well spent. Because of this reaction to increased grants, the Committee does not agree that the grant structure as provided in this section should be increased as was requested in several briefs and submissions. Therefore, **the Committee**

recommends no change in grant structure as outlined in Section 64 (2).

Such grants are made only in respect of assessments made upon lands used for agricultural purposes (Section 62 (2)). The Committee agrees that this principle should be continued and further **recommends** that when such lands are taken out of agricultural use, the grants made with respect to such lands should be repaid. The Committee feels such repayment should be made by the person responsible for changing the use of the lands. However, a prospective purchaser of property should be entitled to ascertain the extent of the grants made with respect to the property so that he can take the amount of those grants into account when negotiating a purchase price. Accordingly, **the Committee recommends** that any person, upon paying a nominal fee, be entitled to obtain from the Ministry of Agriculture and Food a certificate which discloses the amount of the grant that has been paid.

XVI. THE TILE DRAINAGE ACT, S.O. 1972, Ch. 37

The Tile Drainage Act enables the council of a municipality to pass a by-law authorizing the borrowing of money from the Treasurer of Ontario for the purpose of lending the money for the construction of drainage works on agricultural land. When this by-law is passed, owners of such agricultural lands may make application to the council to borrow money for such a purpose. The approval of this application is at the council's discretion and its decision is final. The council is required to give written notice of the decision to the applicant.

The Act provides for an inspector who oversees the work and files an inspection and completion certificate with the clerk. Upon receipt of this certificate, council issues a debenture payable to the Treasurer of Ontario for the funds to be loaned. The Treasurer of Ontario is then authorized to purchase, acquire, and hold the debentures issued under the authority of the Act. The council then lends the money to the applicant in sums of \$100 or multiples thereof for a term of 10 years at a rate of interest determined by the Lieutenant-Governor-in-Council. The amount loaned to any one applicant, however, shall not exceed either the amount applied for or 75 per cent of the total cost of the drainage work for which the loan is made.

The loan is repaid over a period of 10 years at a special equal annual rate sufficient to discharge the principal and interest. The repayment shall be deemed as taxes and the provisions of The Municipal Act apply insofar as they have reference to collection and recovery of taxes and proceedings that may be taken in case of default.

In the course of the Committee's deliberations, little or no criticism was directed at the provisions of The Tile Drainage Act and there were only one or two occasions when the Committee was requested to increase the level of assistance provided.

Research done for the Committee makes it clear that positive benefit-cost ratios in almost every instance result from tiling adjacent lands into the municipal drain. The Committee feels very strongly that municipal drains should only be built when farmers are prepared to tile their lands almost immediately and take full advantage of the improved outlet. The benefit-cost studies conducted by the Committee's research staff indicate that even one farmer tiling 20 acres into a newly constructed drain will place that drain in a highly positive benefit-cost ratio.

To further encourage the drainage of agricultural land by individual farmers, **the Committee recom-**

mends major changes in the procedures of The Tile Drainage Act. It should be mandatory on all councils which have by-laws passed under this Act to lend the total amount provided for in the Act or at least the amount applied for. Some instances were reported to the Committee where councils cut the amount to be loaned to as low as \$80 per acre when the current costs of tiling land were \$180 per acre. In this situation, a farmer is forced to borrow the additional \$100 per acre somewhere else at higher rates of interest, which seems to nullify the purposes of this Act.

The Committee recommends that the total amount available under the Act be raised from 70 to 90 per cent of the total cost of the work and that councils not be permitted to lend a lesser amount unless a lesser amount is applied for.

The Committee feels that the provisions of Subsection 3 of Section 3 should continue and that, when the approval of any application is denied, a written notice of this denial be given to the applicant with reasons therefor. The applicant should then be permitted the right to appeal this decision to the new appeal tribunal outlined in part XIII of this report.

Section 5 (4) of The Tile Drainage Act indicates that interest rates on debentures issued under this Act shall be determined from time to time by the Lieutenant-Governor-in-Council. **The Committee recommends** that hereafter money be loaned under this Act with no interest rate applicable. The Committee was unanimous that the interest rate be reduced from the present 4 per cent. A minority favoured a rate of 2 per cent, but the majority agreed to recommend that the interest rate be eliminated entirely.

This may seem to be extremely generous at first glance. Calculated in terms of what it costs farmers to borrow money, however, it is estimated that lending 90 per cent of the cost of the installation at no interest represents a subsidy of 32 per cent. The present formula of 75 per cent of the loan at 4 per cent interest represents a subsidy of 16 per cent. Thus the Committee's recommendation raises the assistance under the Tile Drainage Act to approximately the same level as the assistance given under The Drainage Act, which is 33⅓ per cent in organized counties.

In making these recommendations, the Committee is acutely aware of the provision in Section 8 of The Tile Drainage Act which says the council "shall levy and collect . . . over and above all other rates a special annual rate" and also of the fact that these rates are deemed to be taxes and as such a first charge on

the property. The authority for collection and recovery of taxes is subject to proceedings under The Municipal Act in case of default.

In line with the Committee's thinking that artificial barriers to land drainage (that is, roads, highways, underground installations, etc.) should bear the additional costs of carrying field under-drainage to a sufficient outlet, **the Committee recommends** that such installations be required to permit crossings of adequate size at the expense of the road authority or installation involved. Normal subsidies should apply in the case of roads or highways. These subsidies should only be available where the plan of field under-drainage has been drawn or approved by the Ministry of Agriculture and Food.

One other caution should be added to this Act. Following the precedent set in the Farm Tax Rebate program, **the Committee recommends** that where tile drainage loans are made on farm land that, within the term of the loan, is converted to any use other than agriculture, the balance of the loan will become immediately due and payable.

It was pointed out to the Committee in hearings that some municipalities are requiring tile drainage loans to be repaid in quarterly or half-yearly installments along with the normal taxes. **The Committee recommends** that repayment installments of tile drainage loans should fall due annually and on the final due date of the normal taxes for the year. The first payment should be due in the year following the date the loan is granted. Another requirement appears to be needed for the protection of prospective buyers. It has been recommended elsewhere that tax certificates include the fact of the existence of an

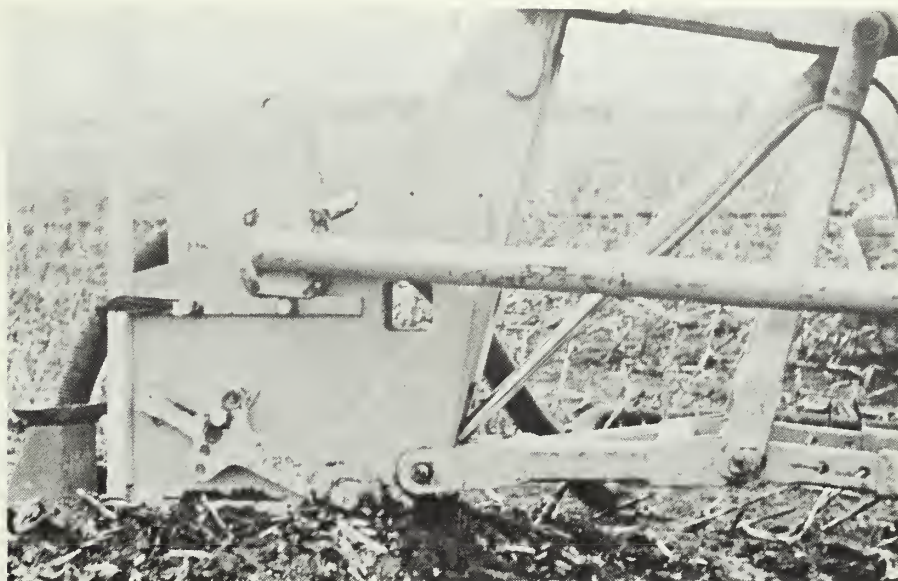
unpaid tile drainage loan. But while this protects the buyer it gives him no indication of the location of the tile.

The Committee therefore recommends that the inspector provided for in Section 4 of The Tile Drainage Act be required to file with his inspection certificate a sketch indicating the location and direction of the tile as laid as well as information on spacing and depth of the tile.

The Committee was surprised to learn from councillors and others that municipal officials still believed that borrowings under The Tile Drainage Act impaired the borrowing capacity of the municipality. This is not so. It was the case previous to 1970, but was changed in 1971.

Councillors also expressed some fear of lending money to inefficient farmers or to farmers already in debt beyond their capacity. The Committee wishes to reiterate, however, that these loans are a first charge on the property and collectable before any other debts. The Committee also feels that it is quite unfair to the applicant to decide his credit worthiness based on rumors and common gossip. The application form for such a loan requires no disclosure of net worth and it is difficult for a council to refuse an applicant for a tile drainage loan on the basis of incomplete or inaccurate information.

The committee is quite aware that this new program as herein recommended might mean severe pressure on clay and plastic tile manufacturers as well as on contractors and agricultural engineers. The Committee is confident, however, that these pressures will be met and that increases in tiled acreage and food production will be the final result.



Plow-type equipment for plastic tile.

XVII. THE ROLE OF THE ONTARIO MINISTRY OF AGRICULTURE AND FOOD

In The Drainage Act, the Ministry of Agriculture and Food is the administering agency and is mentioned in those sections dealing with the grants that are made under The Act. The Minister is also mentioned in connection with drains that extend into Manitoba or Quebec, or vice versa. Other than that, the Minister has no power or authority under this Act. True, the section dealing with grants is permissive and makes it possible for the Minister to refuse to pay the grants if he so wishes. The Act is silent, however, as to grounds for denying a grant application and is also silent with regard to any appeal that a municipality may have if such a grant is denied.

The Committee would like to give the Ministry of Agriculture and Food a greater role in the administration of The Drainage Act. To some extent this greater role has already been undertaken by the Ministry's Drainage Co-ordinator who is in the peculiar position of consulting, advising, and guiding farmers and municipal officials on problems and procedures under the present Drainage Act, but none of these activities have been defined in The Act. The Act neither mentions the Drainage Co-ordinator as such nor does it specify that the Minister may delegate his authority under The Act to a public servant.

The estimates of the Ministry of Agriculture and Food for the fiscal year 1974-75 include the expenditure of \$3,000,000 in drainage grants and \$5,400,000 in the purchase of tile drainage debentures. The present administration of the three drainage acts involves four full-time public servants and one part-time and is estimated at roughly \$150,000. It appears to the Committee that the administration of the duties and responsibilities of the three drainage acts should be given to a separate branch within the Ministry of Agriculture and Food and not be allowed to remain a section within the Agricultural and Horticultural Societies Branch.

The Committee has already recommended grants or subsidies for the proper maintenance, repair, and minor improvements of drainage works. Upon its acceptance, this recommendation will result in a greater budget and more administrative responsibility.

The Committee has also recommended that the Minister be given the authority to initiate drainage works where he believes these works are necessary and also authority to appeal decisions of municipal councils for or against a drain and to appeal from allowances granted by the engineer.

The present Drainage Co-ordinator has already made a commendable start in carrying out his role and has begun to closely observe the details and data furnished him from engineers' reports. With no authority and no jurisdiction, however, the Drainage Co-ordinator has found it difficult to be certain that his data and statistics are complete, since he cannot require municipalities or engineers to provide him with necessary information.

In accordance with the Committee's recommendations, the Ministry will receive copies of all preliminary reports, final engineers' reports, and The Drainage Tribunal decisions. Useful data can be extracted from these reports for the benefit of the whole industry and continued monitoring of costs of materials, labor, and allowances can be carried out. Decisions of the Tribunal can be summarized and distributed for the benefit of all concerned.

The Committee has recommended that drainage superintendents be qualified in each municipality carrying out works under The Drainage Act and that the responsibility for qualifying these superintendents should rest with the Ministry of Agriculture and Food. The courses to qualify these people will undoubtedly be the responsibility of the University of Guelph and the Extension Branch of the Ministry, but the final qualification and certification should remain the responsibility of the recommended Drainage Branch.

In making these recommendations, the Committee is aware that this will be the first time the provincial authority is being inserted to a greater degree in development and promotion of drainage works. While some groups may feel this to be an unwarranted intrusion, it has become apparent to the Committee after talking with hundreds of interested farmers and municipal officials and elected representatives that there is a great desire for one single source of guidance and counsel. There is also a desire for a real measure of co-ordination, and the Committee believes that the recommendations outlined above will provide a measure of support from the provincial government over and above the actual continuing financial assistance. The support, counsel, and guidance received from the present Drainage Co-ordinator and staff is very much appreciated by those seeking help with drainage matters. **The Committee feels it has a responsibility to recommend** that these duties be defined and supported in the legislation which the new Drainage Branch will administer.

XVIII. SPECIAL PROBLEM AREAS

(A) MATTERS UNDER FEDERAL JURISDICTION

Pursuant to Section 92 (10) of the British North America Act, works and undertakings which extend beyond the borders of one province fall under exclusive federal jurisdiction and as such are not under the control of the provincial legislatures except as may be specifically provided in federal legislation. Included in such works and undertakings are inter-provincial railways, pipelines, and the works and undertakings of the Bell Telephone Company of Canada. Accordingly, such matters are not subject to provincial legislation (including the Drainage Act) except where federal legislation specifically makes such provincial legislation applicable.

Section 91 (24) of the British North America Act provides that "Indians and lands reserved for the Indians" are under exclusive federal control. Provincial laws accordingly have no application to Indian reserves except where federal legislation provides otherwise.

This part of the report examines the ramifications of these principles on the applicability of provincial drainage laws to inter-provincial railways, pipelines, the Bell Telephone Company of Canada, and Indian reserves.

Inter-Provincial Railways

Inter-provincial railways such as the Canadian National Railways and the Canadian Pacific Railway are governed by the Federal Railway Act, Sections 208, 209, and 210, of which deal with drainage matters. In essence, Section 208 provides that in the construction of new railways, the railway company shall ensure that a sufficient outlet is provided "so that the then natural, artificial, or existing drainage, or water supply, of the lands shall not be obstructed or impeded by the railway".

Section 209 provides that where any municipality or landowner desires to obtain means of drainage through, along, upon, across or under a railway, such municipality or landowner may apply to the Canadian Transport Commission for approval of such drainage. The Commission may order the terms and conditions upon which such drainage may be effected.

Section 210 provides that, in the alternative, proceedings may be taken in accordance with any legislation of a province through which a railway runs, relating to drainage matters provided that the railway company has the option of constructing the portion of the drain required upon or under the railway. Before

any proceedings are taken under Section 210, the character of the works or the specifications or plans must first be submitted to and approved by the Canadian Transport Commission, except that the Commission has provided by Order E-10 certain specifications and conditions that, if followed, remove the necessity for a formal application to the Commission for approval. As well as standard specifications, the Order provides for obtaining the railway company's consent, the appointment of an inspector by the company, and the supervision of construction by the inspector.

It is clear from these provisions that inter-provincial railways are essentially in the same position as any other landowner. In fact, it has become almost universal for engineers to assess railways for the entire increase in cost of constructing a drainage works through a railway. This practise coincides with the Committee's view that artificial barriers to drainage programs such as highways, public utilities, and railways should indeed bear the entire increase in the cost of constructing drainage works through such areas. Accordingly, **the Committee recommends** that this practise should be formally embodied in The Drainage Act and that the definition of public utility in the Act should be amended to include a railway.

The present provisions of The Railway Act generally present no particular problems to the effective working of drainage legislation in Ontario. However, the Committee received some complaints from municipal clerks that, in many cases, when notices and copies of reports were forwarded to head offices of railway companies, either no reply was received or a reply was received after several months. Furthermore, engineers have experienced difficulties in obtaining co-operation from railway companies to approve specifications for the construction of drainage works through railways and in arranging times for inspection. On the other hand, some railway companies suggested to the Committee that the time permitted under The Drainage Act is not sufficient for the company to adequately consider any notice or report it receives. The Committee believes that such problems are likely due to the adequacy or otherwise of internal communication lines within the particular railway companies. Local municipal clerks and engineers should not be concerned with how speedily the appropriate railway officials become aware of drainage problems once the company has been notified under the Act. Officials of the Canadian Transport Commissioner have assured the Committee that the Commission, as a regulatory agency having general supervisory jurisdiction over railways, will make every effort to ensure that rail-

ways co-operate with municipal councils and engineers in the construction of drainage works through railways. As a last resort, a formal application may be made to the Commission for approval of the crossing pursuant to the engineer's report.

Under the new petition procedure, the railway companies will be notified of the proceedings at the earliest opportunity, and the timing problems they have experienced should be alleviated.

Any notice to a railway company should be forwarded to its head office unless the company has notified the municipal clerk in writing that notices should be sent to some other address.

Pipelines

Pipelines that cross provincial boundaries fall under the jurisdiction of the National Energy Board, which is constituted under the National Energy Board Act. The Act provides that the Board may, upon such terms and conditions as it considers proper, direct a pipeline company to divert or relocate its pipeline if the Board believes that the diversion or relocation is necessary to prevent or remove an interference with a drainage system. The Board may direct by whom and to whom the costs of the diversion or relocation shall be paid. Section 77 of the Act provides that no drainage system shall, except by leave of the Board, be carried across, along, upon, or under any pipeline and that the Board may permit such crossings upon such terms and conditions as it considers proper. It is clear from these provisions that the matter of crossing a pipeline by a drainage works is completely within the National Energy Board's jurisdiction, which includes the power to determine the cost of such crossings and by whom it shall be paid.

While it is impossible to accurately predict how that jurisdiction will be exercised, some guidance can be obtained from the decision of the National Energy Board in *Re Inter-Provincial Pipeline Company* (May 30, 1967). In this case, the company made application for leave to carry portions of its pipeline across certain highways and utilities. During the hearing, questions arose as to the proposed pipeline's effect on municipal and private drainage systems. In its reasons for decision, the Board had occasion to say:

"The Board is, of course, convinced of the necessity for adequate drainage for agricultural land and the desirability of there being as little interference as possible with such drainage, as one aspect of the broader principle that where the public interest requires the construction of a utility such as a pipeline across private lands and other utilities, the presence of the pipeline thereafter should interfere as little as reasonably possible with the use, enjoyment, and development of the lands affected by it."

In particular, the Board stated its policy to require

pipelines to be laid at such a depth that future drainage systems could be installed conveniently. Furthermore, if the pipeline is not located at a depth sufficient to permit efficient tile drainage, the pipeline company should, at its own expense, make those alterations necessary to permit such drainage.

One of the submissions made at the hearing was that the Board recommend to the Government of Canada that the National Energy Board Act be amended so that pipelines which are being constructed or operated under Federal Charter will be brought within provincial drainage law similar to the position of inter-provincial railways. To this submission, the Board said:

"While this proposal engages the sympathy of the Board, it can not entice its support. The Board would consider it undesirable that companies under Federal jurisdiction should be subjected to present or future enactments of any or every Province by means of legislative reference. The Board would however see merit in amendment of the National Energy Board Act to incorporate in it, in general terms, such protections for municipal and private drainage systems as have been offered by Inter-Provincial in this proceeding."

Under the present statute, however, such matters are not specified in the Act, but remain within the discretion of the National Energy Board.

The present policy of the Board appears to favor protecting private and municipal drainage systems. Consequently, the Committee sees no need to make any particular recommendation with respect to this matter at present. The Committee is pleased that the Board has developed the positive policy towards land drainage that it presently observes and hopes that this enlightened policy will continue.

The Bell Telephone Company of Canada

The Bell Telephone Company of Canada historically has taken the position that the provinces have no legal right to subject the Company to their legislation. In general, it would appear that this position is correct in law. ^{1/} Consequently, the provisions of The Drainage Act applicable to public utilities, particularly Section 21 which requires payment by a public utility, do not apply to the Bell Telephone Company.

However, in some instances the Company has deviated from the strict legal position and has relocated its cables at its own cost when the widening of highways or the construction of new drainage systems necessitated doing so. The Company continues to take the position that doing such work at its own expense is by the grace of the Company and that it cannot be legally required to do so.

^{1/} See *City of Toronto vs. Bell Telephone Company* (1905) A.C. 52; *Commission du Salaire Minimum vs. The Bell Telephone Company of Canada* (1966) S.C.R. 767.

Notwithstanding the assertion of the Bell Telephone Company that it cannot legally be required to pay the cost of relocating its lines, the Committee is aware of Section 318 (9) of the Federal Railway Act, which provides:

"Where a municipality or landowner desires to obtain means of drainage or the right to lay water pipes or other pipes, temporarily or permanently, through, along, on, across, or under any telegraph or telephone line within the legislative authority of the Parliament of Canada or any lands forming part of or used in connection with such telegraph or telephone line, the Commission (Canadian Transport Commission), may, upon the application of the municipality or landowner, permit the construction of the drainage or the laying of the pipes upon such terms and conditions as the Commission may consider proper."

The ambit of this subsection is not entirely clear, particularly as to whether the Canadian Transport Commission's power to impose "terms and conditions" includes the power to require the Telephone Company to pay relocation costs. The Committee has been advised by the Commission that there has never been an application made under this subsection, so that no authoritative interpretation has ever been given. In a particularly difficult case, however, a municipality or a group of municipalities may consider it appropriate to apply to the Commission for a ruling under this subsection.

The general policy of the Telephone Company with respect to drainage matters was set out in a letter (March 12, 1973) to the Chairman of the Committee from the Assistant Chief Engineer of Bell Canada. He stated:

"The first policy has to do with ditching operations carried out under the provisions of the Ontario Drainage Act. It is now our policy to waive compensation for plant rearrangements necessitated by the more frequently encountered crossing conflicts unless the costs are substantial or the project is primarily for road improvements.

This is obviously not a general waiver of compensation. There may be a few cases where the proposed locations for a drain may longitudinally conflict with our cable in a legally consented location or on easement. There may also be instances where physical obstacles or right of way problems complicate relocation and add significantly to the costs involved. If under these circumstances and following consultation with the drainage engineer and/or contractor, abnormally high costs to Bell cannot be avoided,

we must reserve the right to bill all or a portion of the costs.

"However, based on our past experience and the manner in which we plan to administer this policy, we anticipate that 80 to 90 percent of the cable/drain conflicts will not result in a billing. This anticipated reduction in the cases billed will depend on close co-operation between the drainage people and Bell personnel in terms of advance notice and planning. We are prepared to extend such co-operation.

The second new policy concerns cable/tile crossing conflicts where private tile drainage systems are installed by individual farm property owners to improve the productivity of their land. Under this new policy we will locate, physically expose, and raise or lower our cable to the extent necessary to permit the farm property owner to proceed with this installation at no additional expense to him. Again, we will require advance notice to avoid delays."

Under Section 21 of The Drainage Act, public utilities under provincial control are required to pay all of the increase in cost necessitated by a drain crossing a public utility. It is apparent that the Bell Telephone Company will not voluntarily place itself in the same position as such utilities, but will reserve the right to pay less than the full cost in some circumstances. Believing that this situation should be corrected, **the Committee recommends** that the Government of Ontario negotiate with the Government of Canada with a view to amending the legislation that incorporates the Bell Telephone Company (or the Railway Act, if appropriate) to make the Company's position the same as provincially controlled public utilities.

Indian Reserves

Indian reserves fall completely within the legislative jurisdiction of the Parliament of Canada and provincial legislation has no application thereto. Thus drainage systems cannot be constructed through Indian reserves and in some instances have simply been constructed up to reserve borders and left there. In the meantime, Indians have not had the agricultural benefits to be derived from land drainage.

Under Section 81 (f) of the Indian Act, a band council is empowered to make by-laws respecting "the construction and maintenance of water courses, roads, bridges, ditches, fences and other local works." However, an Indian band is not permitted to expend band funds unless the Governor in Council has declared that the band has reached an advanced stage of development, and unless an appropriate by-law has been made by the band and approved by the Minister of Indian and Northern Affairs. Alternatively, the Governor in Council may declare under Section 69 of the Indian Act that a band may control, manage, and expend its revenue monies.

Under The Conservation Authorities Act, the definition of a municipality includes a band under the Indian Act that is permitted to control, manage, and expend its revenue monies under Section 69 of that Act. Consequently, it is possible for an Indian band to become a member of a conservation authority and to contribute to the authority's expenses. If an Indian band refused to so contribute, however, it is unlikely that any proceedings could be taken to enforce such contribution.

It has been suggested that an Indian band could be placed in the same position as a municipality or a landowner under The Drainage Act by enacting appropriate definitions similar to that contained in The Conservation Authorities Act. It has been further submitted that if individual Indians object to drains crossing their lands, the band council can enact an appropriate by-law under Section 81 (f) of the Indian Act. It is suggested that the funds to be paid by the Indians would be paid by the Government of Canada or by the band directly following appropriate approval under Section 69 of the Indian Act or under a by-law approved by the Minister of Indian and Northern Affairs.

The Committee has received submissions from Indian representatives requesting that the Indians be permitted to have the benefits of agricultural land drainage and the appropriate subsidies therefor and that The Drainage Act be amended accordingly. The Committee fully agrees with these submissions. However, The Drainage Act is a two-way street, so to speak, in that it confers certain benefits and imposes certain obligations at the same time. The major obligations are that an individual landowner must, for the common good, permit a drain to flow through his lands if the majority of his neighbours consider it necessary and that he must contribute financially to the drain. Under the present provisions of the Indian Act, there is no way to enforce either of these obligations if a particular band council does not wish to permit a drain to flow through a reserve or does not wish to or cannot contribute to it financially.

As mentioned, the Committee fully agrees with the principle that Indians should be entitled to the benefits of agricultural land drainage and the appropriate subsidies. However, the Committee feels just as strongly that Indians should be placed in the same position in law as other landowners insofar as their obligations are concerned. Accordingly, **the Committee recommends** that appropriate amendments be made to The Drainage Act to place Indian reserves in the same position as other lands, provided that appropriate amendments to the Indian Act in conjunction therewith are also enacted by the Parliament of Canada. **The Committee recommends** that the Government of Ontario enter into negotiations with the Government of Canada accordingly.

Summary

1. No change should be made in the present law respecting inter-provincial railways, except that rail-

ways should be included within the definition of "public utility."

2. Considering the present policy of the National Energy Board, no change need be made in the present law respecting pipelines that cross provincial boundaries.

3. The Government of Ontario should negotiate with the Government of Canada with a view to amending the legislation that incorporates the Bell Telephone Company of Canada (or the Federal Railway Act, if appropriate) to make the Bell Telephone Company's position the same as provincially controlled public utilities.

4. Appropriate amendments should be made to the Drainage Act to place Indian reserves in the same position as other lands insofar as drainage is concerned, provided that appropriate amendments to the Indian Act in conjunction therewith are enacted by the Parliament of Canada to place Indians in the same position as other landowners insofar as their obligations are concerned.

(B) EUPHRASIA TOWNSHIP MUNICIPAL DRAIN NO. 1

During 1971, a group of landowners petitioned the Council of Euphrasia Township in Grey County for the construction of a drain pursuant to Section 3 of The Drainage Act. The construction of the drain was eventually halted by an injunction issued by the County Court of Grey County. The saga of this drain presents problems which the Committee believes are fundamental to the effective workings of The Drainage Act, and the Committee accordingly has examined this particular situation in some detail.

Background

During Spring 1971, six landowners petitioned the Municipal Council for the construction of a drain. On June 7, 1971, the Municipal Council appointed an engineer pursuant to Section 3 of the Act. The engineer's report was received by the Council on August 5, 1971 and was considered on August 28. The report was adopted on September 19, 1971, a Court of Revision was held on October 12 and closed October 15. The by-law was given third reading on October 15, 1971.

The North Grey Conservation Authority had been notified of the petition on May 6, 1971.

Following receipt of the engineer's report, several persons filed notice with the Township Clerk in August and September that they intended to make application to the Referee to have the by-law quashed. However, no application was ever made and construction on the project started in October 1972.

Up to this point, it appears that the drain had been properly authorized under the provisions of The Drainage Act and that all necessary procedural steps had been taken. All time limits for appeal had passed with no formal opposition being raised except for a

few appeals to the Court of Revision, which had been dismissed. However, opposition to the drain had been building by those who opposed it primarily on the grounds that they did not want to contribute financially to a drain from which they would derive little or no benefit. This opposition increased following the release of a report prepared by two officials of the Conservation Authorities Branch of the Ministry of Natural Resources. The report suggested that there could be some detrimental environmental impact following the drain construction. The report had been prepared at the specific request of the Resources Manager of the North Grey Conservation Authority. He had vigorously opposed the construction of the drain and subsequently made an affidavit in support of an injunction to stop the drain.

A few days after construction had begun, several landowners in the area obtained an interim ex parte injunction from the local County Court judge against the Township of Euphrasia that restrained the Township from proceeding with the drain construction for a period of one week. Such ex parte injunctions are obtained as an emergency measure without the defendant being heard or even notified that such an injunction is being sought. On the expiry of that injunction, a hearing was held at which the Township was represented by counsel and during which the plaintiffs requested an order continuing the injunction until trial of the action. On October 13, 1972, the judge continued the injunction in the following somewhat curious terms:

“Order to go continuing injunction on terms to be agreed upon between counsel or if no agreement as I shall then provide.”

The purpose of such an interlocutory injunction is to maintain the parties in status quo until the action can be tried and the rights of the parties finally determined.

Since the interlocutory injunction was granted, a municipal election was held and the composition of the Council changed. The present Municipal Council's position is that it will make no attempt to have the interlocutory injunction set aside and will take no steps to force the plaintiffs to proceed to trial. This is perfectly acceptable to the plaintiffs who essentially have achieved the result they desired without the necessity of proceeding to the trial of the action. What was intended to be a temporary injunction until trial has become in effect a permanent one. In the meantime, the petitioners who originally requested the drain construction have no status to take any part in the injunction proceedings and have no means of redress.

The Committee is aware that, in all but the most exceptional cases, it is improper to comment about a case that is presently before the courts on the sound principle that any such comments might prejudice the ultimate outcome. In this case, however, no proceedings have been taken since October 13, 1972, and for all practical purposes the final result has been

achieved. Furthermore, in a case like this, where fundamental questions are posed as to the workability of The Drainage Act and as to the appropriateness of legal procedures available to frustrate the Act, the Committee feels that it is proper and indeed necessary for it (appointed by the legislature of Ontario which, after all, bears ultimate responsibility for all the laws of this Province) to express its views. Accordingly, the Committee shall do so.

Comments

The case of the Euphrasia drain presents in stark perspective many of the general problems that the Committee hopes will be ultimately solved by the recommendations in this report. It represents a situation in which the existing procedures of The Drainage Act were inadequate to resolve the conflict between those who petitioned for the drainage of their agricultural lands and those who opposed it on environmental grounds and on the grounds that it would cause undue damage to their lands. It also presents the narrower problem of how this particular conflict ought to be ultimately resolved.

In general, the main cause of the dispute seems to be that the opponents of the drain did not become aware of its implications until the engineer's report had been prepared. They did not take advantage of their right to appeal to the Referee or they were not aware of the procedures to follow in order to appeal. Presuming for the moment that the environmental objections to the drain are legitimate, such objections did not become apparent until after the time for appealing had expired. There was no requirement, of course, that any environmental impact study be obtained. The Committee cannot help but note that, although the Resources Manager of the North Grey Conservation Authority became actively involved as an individual in the injunction proceedings, the Conservation Authority itself did not see fit to appeal the engineer's report to the Referee as it had a right to do.

The Committee hopes that cases of this nature need not arise in the future if the recommendations in this report are implemented. All parties affected by a drain will be notified at an early stage of the proceedings that a drain is being proposed. In many cases, preliminary studies will be obtained that include an environmental impact study. Clear rights of appeal will be provided to all parties following consideration of the preliminary studies and following adoption of the engineer's final report. All parties will be advised of the procedures to be followed. If these recommendations are adopted, problems such as those arising in the Euphrasia case should be resolved at an early stage.

The Committee believes that the new procedures contemplated will adequately protect the rights of everyone affected by the proposed construction of a drain. **The Committee therefore recommends** that the Act be amended to provide that no injunction shall be issued to restrain the construction of a drain that has been authorized in accordance with The Drainage

Act and that is being constructed in accordance with a valid by-law of a municipal council.

The Committee realizes that an injunction may be appropriate in some cases if, for example, a drain is constructed other than in accordance with the Act or in a location other than that authorized by the by-law. However, the Committee feels that, after an interlocutory injunction has been granted, a municipal council should not be allowed (as in the Euphrasia case) to be inactive to the prejudice of landowners who are detrimentally affected by the injunction. Accordingly, **the Committee recommends** that the Minister of Agriculture be made a party to any proceedings commenced to obtain an injunction to restrain the construction of a municipal drain and that the Minister be permitted to participate in the trial and to take any proceedings that any other party could take, including appeals.

The particular problem raised with respect to the Township of Euphrasia Municipal Drain No. 1 remains to be considered. The drain proponents have been deprived of drainage of their lands because of a conflict with other landowners in the area, primarily on environmental grounds. The merits of that conflict have been finally resolved because of an artificial stagnation of the proceedings. The Committee has concluded that this problem can be resolved only by the unusual, but not unknown, step of a special act of the legislature. The question is how to frame such a statute so that the dispute can be resolved fairly. It must be remembered that the project had reached the stage of complete approval, that construction had actually begun, and that the arguments advanced during the injunction proceedings were presented at a very late date indeed.

The Committee conceives the viable alternatives in a special Act to be as follows:

1. Provide that the Minister of Agriculture shall be deemed to be a party to the original action and shall be entitled to participate in all proceedings in the action henceforth. Further provide that if the action is not taken to trial within six months after the date the special act comes into force, the action shall be deemed to be dismissed. Further provide that no other action shall be commenced to restrain the construction of this particular drain, other than the action which resulted in the granting of the interlocutory injunction. Further provide that if the action is ultimately dismissed, the municipal council shall proceed to construct the drain in accordance with the engineer's report following a new majority petition.

2. Provide that the action for the injunction shall be deemed to be dismissed, that no further injunction can be obtained to restrain the construction of the drain authorized in accordance with The Drainage Act, and that notwithstanding any interlocutory injunction granted to date, new proceedings can be commenced by the landowners desiring drainage in accordance with the new procedures of The Drainage Act as amended.

While both of these alternatives are attractive in certain respects, the Committee believes that the first alternative is preferable. The second alternative might be considered unfair because it completely alters the procedures under which this drain was authorized and challenged. Furthermore, if the second alternative is adopted, additional cost will be incurred in obtaining preliminary studies and a new engineer's report. Adopting the first alternative will simply ensure that the legal claim put forward on behalf of the plaintiffs will be pressed to its ultimate conclusion within a reasonable period of time. Since it is essential in the interests of justice that both sides of the argument be presented to the Court, it is hoped that the Ministry of Agriculture will defend the action as a friend of the Court, if the municipal council does not wish to do so.

The Committee feels this matter requires immediate implementation and suggests that the special act be introduced and enacted at the earliest opportunity as the matter has now been delayed since October 1972.

(C) QUALIFICATIONS OF ENGINEERS AND LAND SURVEYORS

During its public hearings, the Committee became concerned about the performance of the duties imposed on individual engineers and Ontario land surveyors practising under the Act. Criticisms ranged from charges of incompetence to a lack of clarity and detail in report documents. Wide variations were found with respect to allowances under Section 8 and to assessment procedures. In some instances, the Committee was made aware of faulty design and received complaints concerning both underdesign and overdesign. The Committee feels that municipal councils appointing an engineer under The Drainage Act should have the assurance that the appointee is competent to carry out the assignment.

Informal discussions were held with representatives of the Association of Professional Engineers and the Association of Ontario Land Surveyors concerning a means of qualifying persons practising in land drainage. The Committee also consulted the staff of the Ministry of Agriculture and Food, who are involved to a degree with all municipal drainage projects and accordingly with all drainage consultants. The information presented by the Ministry tended to confirm some of the criticisms received from the public.

As a result of considerable deliberation and debate, **the Committee recommends the following:**

1. The Association of Professional Engineers and the Association of Ontario Land Surveyors, either individually or collectively, should initiate an effective means of determining those individuals or firms that are properly qualified to practise land drainage under this Act. This will not be an easy task since there are no formal university courses available in this field and competence in the past has been obtained only through what might be termed an apprenticeship

system. However, the Committee feels that this duty lies within the responsibility of the professional associations and **recommends** that they take the necessary steps to establish and define the qualifications of drainage engineers and land surveyors.

2. The Committee considers this problem to be very important and feels some satisfactory solution must be found, particularly since provincial grants are involved and ample evidence exists that these monies have been used unwisely and improperly in some instances. **The Committee therefore recommends** that the Ministry of Agriculture and Food become the qualifying body if the professional associations involved do not develop a satisfactory system of designation that will protect all concerned.

(D) GREAT LAKES WATER LEVELS

During the early months of 1973 and while involved in its continuing study of drainage, the Committee became aware of the exceptionally high water levels of the Great Lakes which were having serious effects in Essex, Kent, and Lambton counties. Some study was given to the causes of the increase in water levels and consultations were had with officials of the Ontario Ministry of the Environment. The Committee's concern was to determine the amount of water that might be deposited by agricultural land drainage schemes into the Great Lakes. The conclusion was that the amount was minimal and that agricultural drainage works were not responsible for the disastrous consequences resulting from the high levels. In some areas, however, the reverse was true in that the high levels of lake water were backing up the drains to the extent that they were not functioning efficiently.

As a result, the Chairman of the Committee appeared before a sitting of the International Joint Commission in Toronto on January 25, 1973. In his submission, the Chairman expressed the opinion that climatic conditions were the controlling factor in the cyclical fall and rise of the Great Lakes levels. The Chairman called on the International Joint Commission to expedite its study of a plan that will maintain lake waters at a proper level and expressed the hope that senior governments will take the necessary steps to carry out the work associated with the required controls.

(E) BEAVER IN DRAINAGE DITCHES

Early in its travels through eastern and northern Ontario, the Committee was made forcefully aware of the damage and obstruction to drainage works that can be caused by beaver colonies. The Drainage Act makes provision for the removal of obstacles to proper drainage and provides penalties for those who deliberately obstruct or damage a drainage works. Naturally, the present Act makes no mention of the problem of beaver. The Committee believes, however, that measures should be taken to prevent these natural obstructions to costly drains from being permitted to continue.

The Minister of Natural Resources has long been concerned with both the welfare of this popular animal and the obvious damage that it can do when it becomes plentiful in certain areas of the Province. The Ministry is thus in a difficult position; although it is unable to accept the complete elimination of this species from agricultural areas, it recognizes that somehow the damage should and must be controlled. The Ministry has permitted trapping these animals and has encouraged farmers and others to have the animals removed by trappers. While trapping is a proper, humane, and sometimes profitable way of removing these animals from certain areas, the Committee is not convinced that it is the complete answer. Trappers do not necessarily "trap out," but usually leave a seed pair to ensure a supply of animals for the next season's trapping. This practise just continues the depredations the animals can create in drainage ditches.

The Ministry of Natural Resources' position is that the responsibility of removing these animals when they become a nuisance rests with the landowner and that the Ministry merely gives advice to landowners as to methods of removal.

The Committee is acutely aware of the millions of dollars being spent annually by farmers and municipalities and the Government of Ontario in the construction of drainage works under The Drainage Act. The Committee is concerned that these dollars are being wasted in some areas of eastern and northern Ontario because of the activities of nuisance beaver. The Committee has already recommended that the drainage superintendent be given certain additional powers with regard to his duties in maintaining drains in proper condition. In the case of nuisance beaver, the Committee feels that the drainage superintendent also be given special authority in this area.

The Committee therefore recommends that where, in the opinion of the drainage superintendent, a drainage works constructed under The Drainage Act is being damaged or rendered ineffective by the activity of beaver, the superintendent report this fact to the district office of the Ministry of Natural Resources and that the Ministry be responsible for taking the necessary measures to permanently eliminate the animal from the drainage works.

(F) LAKESHORE EROSION

The problem of gully erosion on the lakeshores of southern Ontario was drawn to the Committee's attention when it visited areas of Elgin, Huron, and Bruce counties. Damage to lakeshores is greatest when the lake levels are high, but it even continues to a lesser degree when levels are normal. Some of this normal damage from erosion no doubt results from the cumulative effect of the area's agricultural drains, which tend to seek an outlet directly in the lake or in tributaries leading to the lake.

The Report of the Select Committee on Conservation in 1950 indicated that "losses through shore erosion today have reached a point where they can no

longer be considered the responsibility of the individual person whose land is affected but rather a problem to be considered jointly by the federal and provincial governments and the municipality concerned." That Committee recommended that studies of lake currents and studies of the construction of protective works should be commenced to prevent the losses, which were obviously becoming serious.

It is impossible to measure the effect that neighbouring agricultural areas have on the lakeshore by reason of drainage works constructed under The Drainage Act. There must be some effect, however, and authorities involved should be aware that excessive drainage can be detrimental and that the cumulative affects of drainage can increase the gully erosion along the shorelines.

Other factors also make their contribution to erosion problems. The Committee feels that urbanization, with its growth of paved areas in shopping centres, driveways, and highways, has a much greater effect on lakeshore gully erosion than the water that might be brought down by drainage works.

The Committee has recommended that environmental impact statements should be prepared prior to new drain construction. It is hoped that in preparing such statements for drains that are eventually going to take water to the lakes, the environmental impact committee (proposed in part VIII of this report) would take this erosion problem into consideration and have some comments made regarding the possible effect of the drain on increased shoreline erosion.

(G) A SUGGESTED REGIONAL OR COUNTY DRAINAGE COMMISSION

It has already been recommended that one or more municipalities may appoint a single qualified drainage superintendent to look after all the drain work in the municipalities concerned. Arising from this, the Committee also felt that some counties or regions quite possibly might need and desire all the drainage works in the area to be administered by one body and by one or more drainage superintendents as required. It was suggested that the county or region should appoint and pay for a drainage commission that would carry out all functions of a municipal council under The Drainage Act. The authority of this drainage commission would extend to those drains in townships where the townships had voted by by-law to turn over their responsibility to the county or regional body.

Some counties have already considered this possibility and have indicated their interest by filing resolutions with the Committee. It is quite possible in already established regions that agricultural land drainage receives little or no attention because of the predominance of urban interests and urban elected representatives. **The Committee therefore recommends** that, where municipalities in a county or a region agree and so authorize by by-law a county or

regional drainage commission be organized to direct, supervise, and control all drainage works in those municipalities that have agreed to turn over their responsibilities to the commission.

(H) BARRIERS TO AGRICULTURAL LAND DRAINAGE

Water naturally flows down grade with the force of gravity, and is diverted from such natural flow when barriers such as furrows and dykes are placed in its obvious path. Drainage works are built to carry this flow to a proper outlet in open channels or in underground tiles, but these works must also observe the requirements of gravitational flow.

In constructing drainage works, conflicts inevitably arise with other structures and works, including railways, provincial highways, county and township roads, Ontario Hydro lines, and underground installations such as pipelines and telephone and telegraph cables.

The Committee has definitely concluded that all such works are artificial barriers to both natural and constructed drainage. Because they are barriers and because they are artificial, the Committee contends that the increase in cost occasioned in building the drainage works by the very existence of the barrier must be assumed by the artificial barrier, whatever it may be.

Precedent is to be found in the Railway Act, Revised Statutes of Canada, 1970. Section 208 of the Act clearly outlines the responsibility of railways to make and maintain suitable water pipe, flumes, ditches, and drains along each side of, across, and under the railway in order to connect with the ditches, drains, and watercourses that were on the land through which the railway runs so as to afford a sufficient outlet. The Act states that the natural, artificial, or existing drainage or water supply of the land "shall not be obstructed or impeded by the railway." Thus, the precedence as between railways and agricultural drainage is clearly set out.

Section 210 of the Canada Railway Act also provides that wherever an act of a provincial legislature makes possible proceedings by any municipality or landowner for any drainage work across the property of any other landowner, then similar proceedings may be taken at the option of the municipality or landowner for drainage works across the lands of the railway company. If proceedings are taken with respect to a railway under this section, the provincial drainage laws apply to railway company lands to the same extent the laws apply to any other landowner. This section also provides that the costs of the drain across or through the railway be borne by the company and in all cases shall be based on the increase of the cost of such work caused by the construction and operation of the railway.

Almost the same precedent applies in the case of pipelines. In 1967, the National Energy Board held a hearing in London, Ontario to discuss the application

of Interprovincial Pipelines Ltd. to take their line across the lands of southwestern Ontario and to determine the line's relationship to the numerous agricultural drains with which it was going to interfere or impede. The company stated at the hearing that it was prepared to lay its pipe so that it would not interfere with any existing municipal drain or any planned municipal drain of which it had knowledge. Where an existing line interfered with a municipal drain, the company agreed to lower its existing lines so that it would not interfere.

At this hearing, the Province of Ontario supported the concept of making federal pipelines subject to provincial drainage laws in much the same manner as outlined for railways.

The National Energy Board Act subsequently was amended and Sections 37 and 77 set out the precedent that pipelines must give way to drainage works where the two conflict. The National Energy Board recently issued an order to Dome NGL Pipelines Ltd. on the building of a pipeline across Kent County. This order requires the pipeline company, at its own expense, to take any necessary steps to ensure that its facilities do not interfere either with any existing, future, planned, or unplanned municipal drainage systems or with any existing or future private drainage systems. This order seems to set out the fact that the drains take precedence where pipelines interfere with drains.

Conflicts arising from roads of all levels and standards that cross agricultural drains and vice versa are not as clearly resolved. The Drainage Act regards roads as any other landowner and the engineer assesses them as such in his report. A road is assessed the increase in cost that occurs because its existence prevents the drain from having free right of passage. Drainage engineers accept the theory that a road is an artificial barrier to the progress of the drain, and when they design a drain through or across a road they assess to the road the additional costs required by the road's being there. Although this is an accepted practise among drainage engineers, there is no clear authority in the Act permitting such an assessment.

The opposing contention is that if a municipal drain is being dug through a road and there is no discernible benefit to the road from this new drainage works, the road should not be assessed.

The Committee believes that a road is an artificial barrier to the natural flow and drainage of the land and that excess cost therefore should be assessed against the road. In the light of the precedents established with railways and pipelines, the Committee feels its views can be substantiated. The preeminence of land drainage over all forms of barriers is accepted.

Road authorities should not be regarded as land-owners but rather as any other public utility, and provision should be made in the provincial budget for payment of crossing costs. This suggestion was made

to the Committee in some briefs and submissions. If this were done, township and county road budgets would be relieved of having to meet disastrously large assessments that are a detriment to local maintenance and road building programs.

At present, provincial highways are assessed the cost of passing the drain through the highway and this assessment is turned over to the Municipal Subsidies Branch of the Ministry of Treasury, Economics and Intergovernmental Affairs. This Branch then pays, on behalf of the Ministry of Transportation and Communications, the assessment as set out by the engineer. Where assessments are made against county and township roads, the costs are paid out of the county or township road budgets, which are subsidized (up to 80 per cent in some cases) by the Ministry of Transportation and Communications.

These subsidies are really a form of provincial aid for upgrading and maintaining county and township roads and are not intended to finance drain crossings. The Committee agrees with this view and believes that it is really unfair to have these budgets and subsidies reduced by drainage assessments being debited to the county or township road budgets. One costly road crossing in a small township quite possibly could severely cripple the road superintendent's plans for the rest of the year.

The Committee therefore recommends that the Legislature appropriate funds into the budget of the Ontario Ministry of Agriculture and Food in sufficient amounts to cover the present subsidy to county and township road budgets for necessary crossings of county and township roads by drains constructed under The Drainage Act. In addition, an amount should be provided within the budget of the Ministry of Agriculture and Food to provide for the payment of assessments made against provincial highways and the Ministry of Transportation and Communications. All payments on behalf of provincial, county, and township road crossings should be paid out of the funds, and with the approval of the Ministry of Agriculture and Food.

In tabling this report in June 1974, the Committee wishes to draw to the attention of the Legislature that it believes this recommendation urgently needs almost immediate implementation. This would require that special procedures be undertaken and special authority be given the Ministry of Agriculture and Food to immediately begin payment of these subsidies. The Committee is informed that there is presently in the Province a sense of confusion and disturbance among the municipalities as to the disposition of their road budgets for 1974-75. The Committee, believes that immediate attention to this recommendation would clarify, in the minds of municipal officials the extent of their programs for the rest of this year.

(I) RIVER FLOODING

During its travels, the Committee was made aware of two areas in northern Ontario where river flooding caused damage to bordering agricultural lands and

seriously delayed farmers' spring operations. It was evident from discussions with local municipal officials and farmers that the cost of works for effective flood control would be expensive and was beyond the financial capability of the municipalities and land-owners involved. While river flooding as such was not within the Committee's terms of reference, the matter was still brought to its attention, and it feels some comment is necessary on the solution to the problem.

The Committee believes that such river flooding as was brought to its attention in northern Ontario is the responsibility of the Ministry of Natural Resources through the Conservation Authorities Branch. The two areas involved are not now within the jurisdiction of a conservation authority, making it difficult to solve their problem until a conservation authority is organized in the areas where the flooding occurs. Still, the Com-

mittee feels that this is the only practical solution to an obviously troublesome situation.

The chronic flooding along the South Nation River in eastern Ontario was also drawn to the Committee's attention. There is a conservation authority on the South Nation River and the Committee feels it is this authority's responsibility to take care of the flooding problems. It is possible that corrective measures on the South Nation River may well be beyond the financial capabilities of both authority and the municipalities. If this is so, the Committee feels that, since the area is so extensive, an approach to the Government of Ontario would evoke some support. Perhaps a joint provincial-municipal agreement could be arranged and the necessary works constructed by the conservation authority. Such an agreement was devised some years ago but rejected by the local municipalities.

XIX. WATER MANAGEMENT — A PLAN FOR THE FUTURE

The Committee was impressed with the submissions received from the Committee of Chairmen of the Conservation Authorities of Ontario and from the Grand River Conservation Authority. The central theme of these briefs revolved around the theory and practise of water management. Both briefs deplored the fragmentation of control over water as a resource in Ontario and suggested that the conservation authorities were being hampered in their responsibilities as watershed managers when they had little or no control or input into the planning of agricultural drainage.

The numerous pieces of legislation on the Ontario statute books that seem to conflict with The Drainage Act have already been mentioned but this compilation also indicates an overlapping of jurisdiction and confusion among authorities as to where jurisdiction lies. One conservation authority indicated to the Committee that in its opinion the position could be held that a conservation authority must issue a permit before any drainage works could be constructed. As a solution to the conflicts, the Chairmen of the Conservation Authorities recommended that, since drainage is only one aspect of water management, it must logically be viewed as part of the total water management program in a watershed. The Chairmen's brief contended that, in order to bring drainage into the total watershed management program, the plan outlined in the brief was to be implemented by the Conservation Authorities of Ontario in co-operation with the Ministry of Agriculture and Food, the Ministry of Natural Resources, the Ministry of the Environment, and the local municipalities. The Committee is grateful to the Chairmen of the Conservation Authorities for having brought these basic concepts to its attention.

Florida

The idea of total watershed management that includes land drainage was not forgotten and was again forcibly brought to the Committee's attention when it visited the State of Florida in 1973.

Florida had recently passed legislation entitled The Florida Water Resources Act, 1972, in which the following policy was declared: (1) waters in the State are among its basic resources and such waters have not heretofore been conserved or fully controlled to realize their full beneficial use; (2) it is further declared to be the policy of the Legislature to provide for the management of water and related land resources.

The Act then discusses provisions for promoting conservation and utilization of water and for the development and regulation of dams, reservoirs, and other

works to provide water storage, to handle flood, erosion, and drainage damage, to preserve natural resources, to promote recreation, and to maintain the navigability of river and harbour waters.

The legislation also recognized that Florida's water resources problems would vary from region to region both in magnitude and complexity. The Legislature therefore intended to vest in the Department of Natural Resources the power or responsibility to accomplish the conservation, protection, management, and control of the State's waters with sufficient flexibility and discretion to accomplish these ends through delegating appropriate powers to the various water management districts. The legislation gives to the Department of Natural Resources the responsibility of developing a water-use plan for the integrated and co-ordinated use and development of Florida's waters.

Another section of the legislation created and divided the whole State into five water management districts, two of which were already in existence before the legislation was passed. The Act specifically stated that it was the intent of the Legislature that all territory in the State should be included in water management districts.

The Committee met with senior officials of the Department of Natural Resources who explained the workings of the new Act and the new ground they were breaking to bring the State's total water resources under the management and control of one department of government. The Committee also met with Representative Jack Shreve, a member of the Florida Legislature who had been responsible for developing the bill and taking it through the Legislature. Mr. Shreve described to the Committee the complicated procedure by which legislation is drafted and processed through the Florida Legislature. Although the procedure was long and arduous, he was grateful to the many officials, institutions, and agencies that agreed with his thesis that water management should be controlled by one government agency and not be allowed to proliferate and continue under the auspices of innumerable agencies and bodies.

Nebraska

The Committee was informed through discussions with federal officials in Washington, D.C. that a move similar to Florida's had been undertaken by the State of Nebraska. There is now a Natural Resources Commission in Nebraska which develops and controls all programs dealing with soil and water conservation, watershed protection, overall planning, flood plain management, etc.

This Commission was established as a result of a study by a predecessor Commission that had been ordered by the Legislature to prepare a water plan involving the whole State.

In directing that such a plan be developed, the Legislature recognized that the State's economy depended primarily on its soil and water resources. Therefore, the study's primary objective was to ensure that these resources be wisely developed for the maximum benefit of the citizens of Nebraska. Since the development of Nebraska's natural resources had seemed fragmented, the study recommended that the units of local government which were responsible for resource development should be modified, combined, improved, and empowered to meet present and future needs. Part of the study which developed the State water plan recommended steps to the Legislature that were necessary to overcome the obstacles to resource development arising from cumbersome and outdated local organizational arrangements. It is interesting to note that both Florida and Nebraska have come to the perhaps painful recognition that their present organizations and structures are inadequate to meet modern needs.

It was found that Nebraska had fourteen different types of special purpose districts with responsibility in water and land resource development. This resulted from the patchwork development of legislation over the years dealing with such matters as irrigation, drainage, flood control, ground-water conservation, and mosquito control. The Commission carrying out this study was confused by the number of local districts and had great difficulty determining their location and number. It was estimated, however, that at least 500 of these special purpose districts were organized in Nebraska, with almost 100 in one county sometimes. This tabulation was made in January 1969. The study also pointed out the many defects of this fragmented organization of water management districts. Many of them were too small and did not have adequate financial capability and many overlapped, with an obvious lack of responsibility in many cases.

The final report to the Legislature of Nebraska outlined the alternative courses of action, with the main recommendation being that the single purpose districts be made into multipurpose districts. This required the State Legislature to eliminate the enabling legislation and replace it by legislation with a multipurpose base. Accordingly, it was recommended that there be natural resource districts authorized to carry out and sponsor all known programs for resource development. The study pointed out that these districts could be established on the basis of either river basins or common problems. Some consideration was given to setting up the districts on the basis of river basins, but it was decided to delineate the districts in which most or all residents had a common interest. Because the latter was more easily determined, it was recommended in the study.

The main recommendation was that the State of Nebraska should enact legislation to create natural

resource districts whose objectives should be to carry out water and land resource development on the local level. The major areas of concern were flood control, drainage, recreation, water supply, irrigation, pollution control, wildlife preservation, watershed protection, forestry and range management, flood plain zoning, and soil conservation.

The second recommendation was that the legislation should consolidate all of the State's existing soil and water districts—rural water districts, drainage districts, reclamation districts, and irrigation districts. It recommended a State Commission that would have responsibilities related to the 15 or 20 local natural resource districts.

This Committee feels that there obviously is much to be learned in the co-ordination and management of water resources by studying the experiences of Florida and Nebraska.

Manitoba

Closer to home, the Committee discovered that the Province of Manitoba had taken steps along similar lines. For many years, water control and conservation in Manitoba had been the responsibility of the Department of Agriculture and Conservation, but in 1972, this responsibility was transferred to the Department of Mines, Resources and Environmental Management.

A clear definition and division of authority now exists between the Province and the municipalities with regard to the vast system of drains and floodways which had previously been the responsibility of many municipalities throughout Manitoba. A similarity to Nebraska's background may be noted here in that fragmented municipal laws were leading to confusion and a multiplication of responsibilities. One of the first things Manitoba did to clear up the confusion was to develop a provincial waterways policy. As a result, the natural watershed areas in the Province were outlined and their boundaries established. Waterways were then designated and classified through the application of certain criteria. Drains and waterways of a specified order were then declared to be a provincial responsibility, and thus the first steps were taken to clear up the confusion. Other drains of other orders were the responsibility of the municipalities or of district organizations.

The Committee visited Manitoba in September 1973 and spent three useful days studying the program there. The Committee also visited the first of the conservation districts that had been established under the legislation. The Committee was favourably impressed not only with the structure of the administering Department and the Water Resources Branch but also with the overall nature of the philosophy as expressed by the officials it met.

Certainly it is clear that in water resources development in Manitoba, every possible area is controlled and administered by one agency and one department. These include flood control, drainage, water for agriculture, irrigation, ground-water control, water power,

municipal water supply, and water resources involving recreation, fish and wildlife.

Manitoba's Watershed Conservation Districts Act has a concept of total watershed management and is the basis for a co-ordinated, long-range, co-operative approach to water control and to resources management in general. The whole problem is treated by considering the watershed as a single entity rather than as a series of individual or artificial segments. The watershed is regarded as a community of people and the resources that support them, and the health and welfare of this community depends on good management of the watershed.

The Act has been on Manitoba's statute books for some time, but just now is coming into more general and wide-spread use. The objective of the Act is "to promote the conservation and control of the water resources within the district and for that purpose, to study, undertake and put into effect, operate and maintain a scheme in respect of a district for the purposes of conserving, controlling, developing, protecting, restoring and using — (a) the water resources within or available to the district; and (b) the land, forest, wildlife and recreation resources within the district as may be necessary or incidental to the achievement of these aims and objectives."

The Committee met with officials of the Whitemud Watershed Conservation District, which covers an area of 2,400 square miles on the east side of Riding Mountain. This district has been formed and is managed by local people and is supported by the necessary technical staff from the Province.

The Committee was impressed with the presence and co-operation of many technical people and the interdisciplinary nature of the technology available such as from engineers, biologists, and agriculturists. If watershed management is to be fully effective, obviously many people must be actively involved. Technical and professional people must be concerned with the effects their proposals have on the entire well-being of the watershed. They must be conscious of the affected interests; they must be visionary and must accept people of other disciplines in planning all aspects of good water management. The only goal must be to make the project work. The engineer must be conscious of the related work of the biologist, the soils expert, the wildlife manager, and the forester. All must be jointly involved in making decisions and policies and in implementing them. Municipal councillors, the individual landowners, and provincial politicians must also be involved.

After looking at Manitoba's legislation and programs, it was obvious to the Committee that this Province had a worthwhile program for the co-ordination and rational development of water resource management.

The United Kingdom

In the United Kingdom, The Water Act of 1973 outlines a national policy for water. This Act is the result of many years of studying the need for reorganizing

water and sewage services and was the culmination of many years of studying the problem of overlapping local organization and the proliferation of boards, agencies, and councils. For years, there had been a Central Advisory Water Committee, which was commissioned in September 1969 to consider how the functions relating to water conservation, water resources management, water supply, sewage disposal, and pollution prevention that were being exercised by river authorities, public water undertakings, and sewer and sewage disposal authorities could best be organized and to make recommendations. Their report was tabled in April 1971 and includes an inventory of the various types of bodies associated with water management. The report argued for overall planning. The conflicts of interest which hinder such planning were examined and a plan was set out for necessary co-ordination in the future. The Committee recommended a national water authority and emphasized a certain urgency in ensuring adequate water supply.

While land drainage as such was not within the Advisory Committee's terms of reference, it was obvious that land drainage would be affected by any proposals the Committee made. The Committee therefore noted in its report that the impact of its proposals on land drainage must be given due weight.

The Committee's major recommendation was that there be a national water authority and that there be a number of regional water authorities. As a result of this study, The Water Act of 1973 was passed and received Royal Assent in July 1973, representing a radical restructuring of the management of water services in England and Wales.

It was expected that the proposals under The Water Act would come into effect on April 1, 1974, when new local authorities would come into existence and the smaller authorities would disappear.

The Act finally decided on nine regional water authorities in England and one in Wales to be responsible for water and sewage functions formerly carried out by more than 1,500 separate local authorities. The new authorities are responsible for water resources and supply, sewage, and sewage disposal, pollution prevention, land drainage and flood protection, fisheries, recreation and the amenities of the use of their water space, and some cases of navigation.

It is reported that these authorities will employ 75,000 people and have an annual revenue of about 350 million pounds and an investment budget of 300 million pounds annually.

At the national level, there is to be a National Water Council consisting of the chairmen of the ten water authorities, an overall chairman, and other appointees of the government. The main duty of the National Water Council will be to advise the government on national water policy and to provide the regional water authorities with a forum for discussing common problems, for developing and disseminating

uniform policy and practises, and for providing common services.

The Water Act gives the Secretary of State for Environment and the Secretary of State for Wales the responsibility of securing the execution of a national policy for water conservation, water supply, sewage and sewage disposal, pollution control, and recreational use of water. The Minister of Agriculture, Fisheries and Food retains the responsibility for land drainage and salmon and fresh water fisheries. Schedule 5 of the Act has direct reference to land drainage and calls for the organization of regional land drainage committees in each regional water authority. These committees are concerned wholly with land drainage and are represented by their chairman as one of the members of the regional water authority appointed by the Minister of Agriculture, Fisheries and Food. Under these regional land drainage committees, there are to be local land drainage committees which are to be responsible for any local land drainage scheme.

Summary

Under its terms of reference, this Committee was concerned throughout its two years of study mainly with the administration of the various drainage acts in the Province of Ontario. The Committee's research quickly provided information that other jurisdictions were dealing with land drainage and water problems in a completely new and interesting manner. It is significant to note that all four of the jurisdictions in the preceding discussion had made very recent major changes in legislation to consolidate their legislation. Their thinking and philosophy regarding water problems centred on one body with one control for all aspects of water management.

The Committee is acutely aware that there still tends to be considerable fragmentation of control over

water in Ontario. Appendix III to this report lists some 20 pieces of legislation in Ontario which have reference to water and water control. Water quality is the responsibility of the Ministry of the Environment. Water quantity and conservation is the responsibility of the Ministry of Natural Resources. Agricultural land drainage is the responsibility of the Ministry of Agriculture and Food. It appears to this Committee that Ontario is lagging behind the other jurisdictions it examined in the development of water resources management.

As a program for the future, **this Committee would therefore recommend**, that the Government of Ontario establish a task force or committee to study the future management of water in the Province, with one of its terms of reference being the possibility of consolidating total water control in the Province into one ministry.

The Committee was impressed with the development of such a plan in the United Kingdom and equally impressed with The Water Act of 1973, where total control of water management was given to the Secretary of State for the Environment and to the Minister of Agriculture for his segment of responsibility — namely, land drainage. This was possibly a political compromise which for some reason was deemed appropriate in the United Kingdom. This Committee does not believe that such a compromise would be necessary in Ontario and hopes that the result of the study of the proposed task force or committee would be a recommendation that would consolidate the total control of water resources in the Province in one ministry. Since water knows no political boundaries, since the quantity of water cannot be divorced from the quality of water, and since agricultural land drainage has some impact on both quantity and quality of water, these matters should be under the control of a single ministry.

APPENDIX I. ITINERARY AND HEARINGS OF THE COMMITTEE

Date	Place	Date	Place
1972			
July 24	Toronto	March 7	Woodstock
August 23-24	Kingston	March 15	Toronto
August 27	Smiths Falls	March 19	Toronto
August 28-29	Cornwall	June 27-28	Kimberley
September 14	Toronto	July 4	Wallaceburg
September 19-20	Peterborough	July 5	Kincardine
September 26-27	Halifax, N.S.	July 10	Newmarket
September 28-29	St. John's, Nfld.	July 11	Beaverton
October 3	Fort Frances	July 12	L'Orignal
October 4	Dryden	July 16	St. Catharines
October 10	New Liskeard	July 17	Ancaster
October 11	Timmins	July 23	Cayuga
October 17	Sault Ste. Marie	July 24	Simcoe
October 18	Thunder Bay	August 28	Barrie
November 1	Toronto	August 29	Manitowaning- Gore Bay
November 2	Toronto	August 30	North Bay
November 7	Pembroke	September 4	Toronto
November 8-9	Quebec City	September 5	Toronto
November 15	Toronto	September 11-14	Winnipeg
December 18	Toronto	September 18	Elora
		September 19	Listowel
		September 27	Chatham
1973			
January 8-9	Sarnia		
January 10	Chatham		
January 11	St. Thomas		
January 18	Toronto		
January 19	Toronto		
January 23	Toronto		
January 24	Toronto		
January 26	Washington, D.C.		
January 28-Feb. 2	West Palm Beach, Fla.		
February 7	London		
February 13	Toronto		
February 14	Essex		
February 21	Toronto		
February 22	Toronto		
March 1	Toronto		
March 6	Brantford		

APPENDIX II. ORAL AND WRITTEN SUBMISSIONS TO THE COMMITTEE

ORAL SUBMISSIONS

Allen, W.K.
RR 1,
New Liskeard

Baker, Eric,
Suite 408,
330 University Avenue,
Toronto

Ball, Mabel,
Englehart

Beaudry, Edmond
RR 1,
Sturgeon Falls

Beecher, John C.
P. O. Box 220,
Westport

Belanger, L. J.P.
Box 130,
Earlton

Bell Canada, per
Jack Hassell, Assistant Chief
Engineer,
393 University Avenue,
Toronto

Big "O" Drain Tile Company,
per Mac McDougall, Sales
Representative,
Box 189, Hensall

Blasco, John
Brewers Mills

Boere, James,
RR 5,
Forest

Bothwell, T. Ray,
RR 4,
Cobourg

Brabec, John
RR 1,
Maxville

Brignall, John,
Box 87,
Oxdrift

Bryce, Jack
Ontario Hydro

Bukator, Mayor George,
City Hall,
Niagara Falls

Canadian National Railways,
per Messrs. Laviolette and Dafoe

Carruthers, Don,
RR 5,
Cobourg

Caswell, William,
RR 2,
Meaford

Chatfield, S.G.,
Box 195, 7 Blende Street,
Red Lake

City of Port Colborne
City Hall, Port Colborne,
per Alderman Marinelli

Clement, The Honourable John,
Minister of Consumer and
Commercial Relations,
Toronto

Corporation of
the City of Welland,
City Hall, Welland
per Mayor Allan E. Pietz

Corporation of
the Township of Thurlow
RR 6, Belleville
per Horace Casey,
Reeve and Deputy Reeve Forsyth

Clarke, Christie,
RR 2,
Meaford

Cocking, Ron,
RR 2,
Fisherville

Committee of a Thousand,
Box 185, Niagara Falls,
per N. R. Mitchinson

Corporation of
the Township of Armstrong,
Earlton,
per Roger Deslandes,
Clerk-Treasurer

Corporation of
the Township of Dover,
P. O. Box 217, Chatham
per R. W. Gagner,
Clerk-Treasurer

Corporation of
the Township of Orillia,
P. O. Box 159, Orillia,
per Joseph T. McCann,
Clerk-Treasurer

Corporation of
the Township of Romney,
Box 610, Wheatley
per Lyle Jacobs, Clerk-Treasurer

County of Bruce,
Chesley,
per Vernon Emke, Warden

County of Huron
Court House, Goderich,
per R. V. Pattison, Warden

County of Oxford,
RR 2, Burgessville,
per Warden W. L. Dickson

County of Wentworth, Court House, 50 Main Street East, Hamilton, per Warden J. M. Southall	Falls, J.C., RR 2, Meaford	Hall, Murray, Essex
Curtis, Marie, RR 1, Kimberley	Faulkner, Reginald, RR 1, Stittsville	Hart, John, R.R. 3, Woodstock
D'Allassior, H., 260 Lakeshore Road, St. Catharines	Farr, Archie, RR 2, Lowbanks	Hatchings, Elwyn, Westport
Dietrich, William, Wallacetown	Favron, James RR 1, Hilliardton	Hayes, Burton, R.R. 2, McAlpine
Dionne, R., Box 69, Earlton	Foster, George, Kegawong	Hizert, Oscar, Grimsby
Dochstader, J. M., RR 3, Wellandport	Gamsby and Mannerow Limited, 409 Woodlwich Street, Guelph, per G. D. Gamsby, P. Eng.	Hnatiuk, George, R.R. 2, Box 10, Devlin
Dortmans, Bert, RR 1, Breslau	Gormley, Jim, R.R. 4, Echo Bay	Hodge, Cecil, R.R. 3, Harley
Downey, John, RR 1, Minesing	Grandoni, Peter, 4810 Garner Road, Niagara Falls	Hoffman, Dr. D. W., Department of Land Resource Science, Ontario Agricultural College, University of Guelph, Guelph
Dresden Tile Yard, RR 2, Dresden, per Lee McCaughrin	Greenaway, Clarence, R.R. 2, Meaford	Halbewachs, John, R.R. 1, Ruthven
Edmunds, R. A., County Engineer, 860 William Street, Cobourg	Greene, Ethel, 362 Rosedale Drive, Whitby	Hunt, Alderman Ivan, 4502 Marshall Road, R.R. 3, Niagara Falls
Essex County Federation of Agriculture, per Lyle Pierce RR 1, Comber	Greer, Galloway and Associates Ltd., Consulting Engineers, 10 Pembroke Street West, Pembroke, per G. B. Watson	Huron County Federation of Agriculture, Box 310, Clinton, per John Stafford and Phil Durand
Essex County Soil and Crop Improvement Association, per Gene Mailloux, Essex	Gregson, Robert, R.R. 1, Straffordville	Jacobs, Alice, R.R. 2, Box 10, Devlin
Falls, Ellwood, RR 2, Meaford	Guthrie, Joseph V., R.R. 4, Smith's Falls	Johnston, Hugh, R.R. 1, Thornloe
Falls, Gwendolyn, RR 2, Meaford	Haggerty, Ray, M.P.P., Parliament Buildings, Toronto	Joyce, Wilfred, Melbourne Bay

Kerrigan, Mrs. Philip, R.R. 1, Wyoming	Lockyer, James, Manitowaning	Moyle, Ronald H. R. R. 6, Perth
Kitchen, Russell B., R.R. 2, St. George	Loranger, Louis, Earlton	Municipality of Assignack, Manitowaning, per Reeve H. Moggy
Kilszcz, Mrs. Josephine, R.R. 2, Kingsville	Lovelock, M., R.R. 1, Richmond	McDowell, W. C. County Engineer, Box 601, Simcoe
Kuhl, Gordon, R.R. 2, Desboro	Lundy, Mitchell, R.R. 3, Chatsworth	McKeemen, W. Clyde, P. O. Box 277, Kincardine
Kyle, H. G., R.R. 4, Meaford	Madill, John E.,	McLean, Marvin, R. R. 2, Inverary
Lackie, Howard and Carson, R.R. 5, Smith's Falls	Maitland, William, R.R. 3, Jasper	McKnight, Harold, Reeve, Township of Euphrasia, R. R. 4, Meaford
Laframboise, Edward, Earlton	Mannerow, Wm., P. Eng., Gamsby and Mannerow Limited, 409 Woolwich Street Guelph	McNalty, Evan R. R. 2, Meaford
Laidlaw, Don, Troy	Masse, Bernard, R.R. 1, Belle River	McNeely, P., P. Eng., McNeely, Lecompte & Associates Ltd., 2145 Laurier Street, Rockland
Lalonde, Ethel, R.R. 1, Elginburg	Matheson, Donald A. and John A., 11 Ann Street, Havelock	McNevin, Gee and O'Connor, Barristers and Solicitors, 43 William Street North, Chatham per L. G. O'Connor
Lanark Milk Committee, Carleton Place, per Mr. Bob McRae	McKinnon, Peter R.R. 2, Bath	Nadon, Edmond, R. R. 1, Cumberland
Lanktree, Edward, Rocklyn	Middlesex County, R.R. 7, London, per G. Wallace Laidlaw, Warden	Nelson, Walter, Drainage Commissioner, R. R. 1, Brownsville
Lepard, Nelson, R.R. 2, Markdale	Mills, Clifford, R.R. 2, Bruce Mines	North Niagara Federation of Agriculture, P. O. Box 80, Campden, per Cliff Hoffman
Leslie, Christina, Box 844, Blind River	Moore, Robert G., P. Eng., Engineer and Road Superintendent, County of Elgin, St. Thomas	Nowitsky, Mrs. John, R. R. 5, Waterford
Lewington, Peter, Larigmoor Farm, R.R. 3, Ilderton	Morrison, Robert R. R. 3, Langton	Oakes, Cecil, R. R. 7, Orillia
Lindsay, Charles E., R.R. 2, Embros	Moulton, Ken Mindemoya	

Oneidas of the Thames,
Southwold,
per Chief James Ireland

Osawamick, Sam
Wikwemikong

Phelps, Herbert,
Box 261, Perth

Posthumus, John
Wolfe Island

Prescott County Soil and Crop
Improvement Association,
per A. Oiumet,
St. Albert

Rammelaere, B.
R. R. 2,
Tilbury

Ricker, Maxwell J.
R. R. 1,
Dunnville

Robertson, Wally,
Elmvale

Rowntree, Russell,
Rowntree Farms Limited,
R. R. 2, Woodbridge

Russell County
Federation of Agriculture,
R. R. 2, Russell

Schertzinger, P.
R. R. 2,
Port Colborne

Sharpe, D. J.
R. R. 1, Mar

Sherwood, A. J.
Dungannon

Spencer, C. G.
Brant County Engineer,
Court House, Brantford

Stark, Harry
R. R. 3, Port Rowan

Stewart, Elwood
R. R. 1, Princeton

Stewart, John H.
Morriston

Stewart, Mackie A.
R. R. 1, Forest

Tate, J. H.
72 Barker Street,
London

Taylor, N.
R. R. 2,
Fenelon Falls

Teeter, Betsy
R. R. 1, Camlachie
Township of Ancaster,
300 Wilson Street, Ancaster,
per Mr. R. G. Morrow

Township of Assiginack,
per Mr. Lloyd Haver,
Manitowaning

Township of Atwood,
Box 27, Rainy River,
per Mr. J. H. Hammond,
Clerk-Treasurer

Township of Beverly, Lynden,
per Murray Betzner, Deputy-Reeve
and J. R. McColl, Clerk

Township of Binbrook,
Binbrook P.O.,
per D. Woodwork, Reeve

Township of Brant,
R. R. 4, Walkerton,
per Bruce W. Parker, Reeve

Township of Caldwell,
Box 12, Verner,
per Lionel Beaudin, Reeve

Township of Caledonia,
St. Bernardin,
per Mrs. G. Levac, Clerk

Township of Caradoc,
Box 190, Mount Brydges,
per Morley Gough, Clerk

Township of Chapple,
Barwick,
per C. A. Wilson,
Clerk-Treasurer

Township of Darlington,
R. R. 2, Bowmanville,
per C. Down

Township of Delaware,
R. R. 2, Lambeth,
per J. C. Brown,
Road Superintendent

Township of Dereham,
R. R. 1, Mount Elgin,
per L. Barrett, Reeve

Township of Downie,
R. R. 7, St. Marys,
per J. Worden, Councillor

Township of Eastnor,
Lion's Head,
per R. Liverance, Reeve

Township of East Oxford,
R. R. 4, Woodstock,
per Wayne Johnson, Clerk

Township of Elma,
Atwood,
per George S. Tucker, Clerk
and R. Robinson, Reeve

Township of Eramosa,
R. R. 1, Rockwood,
per Lloyd Hindley, Clerk

Township of Essa,
Angus,
per Mickey Gervais,
Deputy-Reeve

Township of Evanturel,
R. R. 1 Englehart,
per H. C. Grant,
Clerk-Treasurer

Township of Gosfield North,
R. R. 1, Essex,
per Delmer Bridgen, Reeve

Township of Hibbert,
Dublin,
per Charles Friend, Clerk and
Henry Harburn, Deputy-Reeve

Township of Howland,
R. R. 1, Little Current
per Alan Morphet

Township of Hudson,
R. R. 1, New Liskeard

Township of Innisfil,
per Eben Sawyer,
Drainage Inspector

Township of Johnson,
Desbarats,
per Elwood McKinnon, Reeve

Township of Kenyon,
R. R. 4, Alexandria,
per Albert Faubert, Reeve

Township of Laird,
R. R. 4, Echo Bay,
per Mrs. L. Tomlinson, Clerk

Township of Lochiel,
R. R. 1, Alexandria,
per Gerard Massie, Reeve

Townships of Macdonald, Meredith
and Aberdeen Additional,
Box 10, Echo Bay,
per Dick Mason, Reeve

Township of Mara,
R. R. 1, Brechin,
per Peter Forbes, Reeve

Township of Melancthon,
R. R. 3, Shelburne,
per Albert Rutledge, Reeve

Township of Mersea,
Leamington,
per Bob Hatt, Councillor

Township of Middleton,
Box 220, Courtland,
per Mrs. E. M. Pettinger, Clerk

Township of Minto,
R. R. 3, Harriston,
per Jim Connell and
Matt Seifried, Reeve

Township of Morris,
R. R. 4, Wingham,
per W. J. Elston, Reeve

Township of Moulton,
R. R. 8, Dunnville,
per J. McCombs, Reeve

Town of Niagara-on-the-Lake,
Niagara-on-the-Lake,
per Mayor J. Froese

Township of Nichol,
per Harold Reed,
Councillor

Township of North Oxford,
R. R. 3, Ingersoll,
per Hartwell Baigent, Reeve

Township of Onondaga,
R. R. 2, Caledonia,
per James McBlain, Reeve

Township of Ops,
Lindsay,
per J. Payne, Councillor

Township of Osnabruck,
Box 340, Ingleside,
per E. E. Marcellus, Clerk

Township of Pilkington,
R. R. 1, Elora,
per Sam Bowman, Reeve

Township of Raleigh,
R. R. 5, Merlin,
per Lewis W. King,
Clerk-Treasurer

Township of Ramsay,
R. R. 2, Almonte,
per Robert H. Brydges, Clerk
and George Hilliard, Reeve

Township of Salter,
May and Harrow,
Massey,
per Mac Emiry, Reeve

Township of Sandwich South,
Oldcastle,
per Bert Bedford,
Clerk-Treasurer

Township of South Dorchester,
R. R. 1, Springfield,
per J. B. Wilson, Reeve

Township of Southwold,
Fingal,
per Bruce A. Lyle, Reeve

Town of Tecumseh,
per Mayor Don Lappan

Township of Thorah,
R. R. 2, Beaverton,
per Russell Morrison, Reeve

Township of Tiny,
per Howard Grier

Township of Townsend,
R. R. 4, Simcoe,
per C. Stuart, Reeve

Township of Vespra,
Midhurst,
per A. Johnston, Deputy-Reeve
and Earl Richardson, Clerk

Township of West Garafraxa,
Belwood,
per W. B. Smith, Clerk, and C.
Louttit, Reeve

Township of West Gwillimbury,
R. R. 2, Bradford,
per Orville Hughes, Reeve

Township of West Luther,
R. R. 1, Conn,
per G. H. Duncan, Clerk
and Jack Lennox, Reeve

Township of West Nissouri,
R. R. 3, Thorndale
per Nelson Elliott, Reeve

Township of Windham,
Windham Centre,
Denis L. Rogerson, Drainage
Commissioner and F. J. Peacock,
Reeve

Twelvetrees, W. A.
County Engineer,
605 Rossland Road East,
Whitby

United Counties of
Prescott and Russell,
P.O. Box 304, L'Orignal,
per Raymond Ouimet, County
Administrator and Clerk-Treasurer

Vandall, Professor Paul E.
Faculty of Arts and Science,
University of Windsor, Windsor

Vander Bye, Brian
R. R. 8, Peterborough

Visser, Ted R.
Edward Avenue,
R. R. 2, Newmarket

Vojir, John B.
Township of Maidstone,
Maidstone

Watson, Jean
Innerkip

Whitney, G. R.
Regional Biologist,
Government Buildings, Kemptville

Wisniowski, J.
P.O. Box 301,
Beamsville

Yanchula, Cyril Sr.,
R. R. 1, Forest

Yundt, Eldon
Bruce County Engineer,
Box 398, Walkerton

Zorra Earthmovers,
R. R. 3, Woodstock,
per Arthur Eddy

WRITTEN SUBMISSIONS

Ainley and Associates Limited,
Consulting Engineers and
Planners,
105 Hurontario Street,
Collingwood,
per. C. W. Grant, P.Eng.

A. J. Graham Engineering
Consultants Limited,
2277 Riverside Drive,
Ottawa,
per. Alex Graham

Albright, Jos.
Hillside Ranch,
R. R. 2, Mattawa

Algoma District
Municipal Association,
Echo Bay,
per A. Corboy,
Secretary-Treasurer

Amos C. Martin Ltd.,
Box 157, Parkhill
per Clarence Martin, Vice-
President

Anderson, Russell J.,
R. R. 1, Winchester

Andrushko, John,
R. R. 1, Beamsville

Armstrong Maurice and
Armstrong, C. G. Russell,
Land Surveyors, and Drainage
Engineers,
Suite 317, Bartlet Building,
Windsor

Arnold, Evan
R. R. 1, Chatham,

Arnold, F.B.D.
County Engineer,
County of Middlesex,
367 Ridout Street, North,
London

Association of County Engineers of
Ontario,
1 Wellington Street East,
Brampton,
per R. W. Knight,
P.Eng., President

Ausable-Bayfield
Conservation Authority,
Exeter,
per Roger D. Martin,
Resources Manager

Barrett, Harry B.
Supervisor,
Norfolk School of Agriculture,
P. O. Box 10, Simcoe

Barrette, Leopold
Reeve,
R. R. 2, L'Orignal

Batho, Herb,
R. R. 5, Woodstock

Beaudry, Edmond,
R. R. 1, Sturgeon Falls

Belford, Dorothy,
R. R. 1, Codrington

Blackburn, Dr. G. J.
R. R. 4, Cobourg

Blake, Kenneth N.
Box 85, Straffordville

Blaney, Stanley
R. R. 2, Vankleek Hill

Blazetich, Frank
1108 Pelham Street South,
Welland

Bogaart, Alex
R. R. 1, Mooretown

Bosman, R.
R. R. 1, Laurel

Boyer, Guy
663 Alesther Street,
Ottawa

Branch, G. P.
R. R. 1, Norval

Brown, Ronald,
Port Lambton

Brubaker, J. E., P. Eng.,
Ministry of Agriculture and Food,
University of Guelph,
Guelph

Bruce County Council,
P. O. Box 190, Paisley,
per W. S. Forrester,
County Clerk

Brydges, W. Stewart
P. O. Box 490,
Geraldton

Bushell, Audrey
Port Rowan

Campbell, Mark
80 Cameron Avenue,
Sault Ste. Marie

Canadian Wildlife Service,
Aurora,
per D. G. Dennis

Chemong Lakeside
Ratepayers Association,
Omeme, e,
per A. E. Lewis, President

Chesapeake and Ohio Railway
Company,
per Patrick G. Furlong, Solicitor,
Suite 212, Windsor

Chippewas of Rama Road,
Rama Road P. O.,
per Chief Norman V. Stinson

Chippewas of Sarnia,
978 Toshmoo Avenue, Sarnia,
per Chief Gerald Maness

Chislett, William, R. R. 2, Scotland	Corporation of the Township of Chinguacousy, 150 Central Park Drive, Bramalea, per Grant Livingston, Clerk-Assistant	Dennis, Murray A., R. R. 1, Walton Department of the Environment, Box 490, Sault Ste. Marie, per L. A. Smithers, Chairman
Christian Farmers Federation, Box 135, Drayton, per Elbert van Donkersgoed, Secretary-Manager	Corporation of the Township of Gloucester Municipal Hall, Box 333, R. R. 4, Ottawa	Department of Indian and Northern Affairs, 55 St. Clair Avenue West, Toronto
City of Port Colborne, 239 King Street, Port Colborne, per J. H. Wilhelm, City Administrator	Corporation of the Township of Nepean, 3825 Richmond Road, Ottawa, per Jack Morrison, Technical Director of Works	Derrick, Donald W. Lambton County Engineer, County Buildings, Sarnia
Civic Environment Committee, 86 Farewell Street, Oshawa, per Tony Peleshok, President	Corporation of the Township of Orford, Highgate, per Albert Glassford, Clerk- Treasurer	Deschryver, G. R. R. 3, Blenheim
Comber Tile Yard, P. O. Box 26, Comber, per Russell Wright, Manager	Council of the Corporation of the Township of Moore, in co-operation with The Moore Township Ratepayers' Association, per Donald C. MacDonald and Eldon Brown, Reeve	DeSoto, Margaret, Group 9, Box 29 Fruitland
Committee of Conservation Chairmen, Subcommittee on Land Drainage, Box 601, Simcoe, per J. Grant Smith, Chairman	County of Lambton, 700 North Christina Street, Sarnia, per W. C. McRorie, County Clerk	Dickinson, Dr. Trevor School of Engineering, University of Guelph, Guelph
Conservation Council of Ontario, Suite 604, 11 Adelaide Street West, per Clive Goodwin, Managing Director	County of Lanark, 43 Drummond Street East, Perth, per D. K. McLean, Clerk-Treasurer	Dochart Brick and Tile Company Ltd., Box 250, Arnprior, per J. S. McKay, President
Cooper, T. Stewart Markdale	County of Wellington, Court House, Guelph, per Ken Schilling, Councillor	Dorney, R. S. Professor and Director, Faculty of Environmental Studies, School of Urban and Regional Planning, University of Waterloo
Corporation of the City of Windsor, City Hall, Windsor, per A. S. Kellerman, Solicitor	Crawford, Peter C., P.Eng., County Engineer and Road Superintendent, Municipal Building, P. O. Box 1230, Chatham	Drainage Committee of the Association of Ontario Land Surveyors and the Association of Professional Engineers of Ontario, per E. H. Uderstadt, O.L.S. and D. McGeorge, P.Eng.
Corporation of the Borough of Scarborough, 2001 Eglinton Avenue East, Scarborough, per Roger K. Brown, P.Eng., Commissioner of Works	Culp, George A., R. R. 1, Beamsville	Drainage Committee, East Grey Anglers and Hunters, per Herman McConnell, President
Corporation of the Town of Niagara-on-the-Lake, Niagara-on-the-Lake, per G. Voth, A.M.C.T., Administrator/Treasurer	Daymond Limited, P. O. Box 1030, Chatham, per B. E. Easton, Agricultural Consultant	Drury, Mary R. R. 1, Englehart
Corporation of the Township of Chatham, 2 Lowe Street, Chatham, per Francis Ewing, Clerk-Treasurer		Dundas County Soil and Crop Improvement Association, R. R. 1, Brinston, per Lorne Henderson, President
		Dundas Federation of Agriculture, Mountain, per Hugh Blaine, Director

Elgin County Soil and Crop Improvement Association, Heiko Oegema, President	Gillingwater, T., Box 482, Sutton	Haw, Charles, Saugeen Valley Conservation Authority Proton
Elgin County Federation of Agriculture, R. R. 2, West Lorne, per Ken Watterworth, Secretary	Glengarry Soil and Crop Improvement Association, per Gordon Ferguson	Hawkins, M. E., 2202 Prospect Street, Ottawa
Elmdale Subdivision Association, R. R. 4, Leamington, per W. V. Climie, Vice-President	Globe Glass Saturaters Ltd., Petrolia, per Martin Raaymakers, General Superintendent	Hayward, Ferguson, R. R. 1, Brigden
Engholm, L. H., R. R. 6, Cobourg	Grand River Conservation Authority, Box 729, Galt, per G. M. Coutts, General Manager	Hemminick, Susan, 41 Gilmour Crescent, Kitchener
Faubert, Gordon, R. R. 2, Sarnia	Gregg, Ralph, Agricultural Engineer Ministry of Agriculture and Food, Newmarket	Holdsworth, Mrs. N. M., R. R. 4, Woodstock
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R. R. 2, Russell,
per James Bertrand, Secretary

Russell County Soil and Crop
Improvement Association,
per Albert Ouimet

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R. R. 2, Claremont

Sutherland, George,
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Clerk-Treasurer

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per Sam J. Mitchell, Clerk and
Treasurer and J. D. McGugan,
Reeve

Township of Canborough,
R. R. 1, Dunnville,
per Arthur D. Bradford, Clerk and
Maxwell J. Ricker

Township of Chisholm,
R. R. 4, Powassan

Township of Day and Bright
Additional,
R. R. 2, Iron Bridge,
per Mrs. Gwen Mosher,
Clerk-Treasurer

Township of Dunn, R. R. 4, Dunnville per Keith Richardson	Township of Pakenham, Box 39, Pakenham, per R. A. Stewart, Reeve	Union of Ontario Indians, Suite 804, 1300 Yonge Street, Toronto, per Lyle Riley, Acting President
Township of Dunwich, Dutton, per Donald Leitch, Drainage Inspector	Township of Plympton, Box 400, Wyoming per Archie McKinlay, Clerk and Tom Steadman, Reeve	United Counties of Prescott and Russell,, P. O. Box 304, L'Orignal, per Raymond Ouimet, County Administrator and Clerk-Treasurer
Township of Eastnor, Lions Head, per S. L. Rutherford, Clerk	Township of Proton, R. R. 1, Dundalk,, per Warden Harry Martin	United Extrusions Limited, 33 Centennial Road, Orangeville, per R. N. Williams, General Manager
Township of Enniskillen, R. R. 1, Brigden, per Les Hall, Reeve	Township of Ross, Cobden, per H. L. Ross, Clerk-Treasurer	Villeneuve, Osie F., M.P.P., Parliament Buildings, Toronto
Township of Euphemia, Florence, per Angus S. McGillivray, Clerk	Township of Salter, May and Harrow, Box 399, Massey, per Austin Clipperton, Clerk	Vriesacker, Robert, R. R. 2, Woodslee
Township of Flos, Elmvale, per Earl Elliott, Reeve	Township of Sandwich West, 5950 Malden Road, Windsor, per Ray Dagleish, Clerk	Walpole Island Indian Council, R. R. 3, Wallaceburg, per A. J. Soney, Band Administrator
Township of Harwich, Blenheim, per Gordon L. Huffman, Clerk-Treasurer	Township of Sombra, Box 40, Sombra, per Maurice D. Burke, Clerk- Treasurer, and James Moran, Reeve	Wardell, Leslie, R. R. 1, Ripley
Township of Hilliard, R. R. 2, Thornloe, per Chester Edwards, Clerk-Treasurer	Township of Sturgeon Falls, Box 1390, Sturgeon Falls	Weido, Larry, Zurich Public School, Exeter
Township of Johnson, Desbarats, per Marjorie McEwen, Clerk	Township of Warwick, R. R. 6, Forest	Wellington Federation of Agriculture, 12 Brentwood Drive, Guelph, per Peter Hannam, President and Eugene Robinson, Chairman
Township of Mersea, Leamington, per Lynn Foster, Clerk	Township of Windham, R. R. 1, Windham Centre, per F. J. Peacock, Reeve	Wentworth Soil and Crop Improvement Association, per W. D. Keys, and Murray Cranston, R. R. 1, Ancaster
Township of Minto, Moorefield, per Keith Dickson, Clerk-Treasurer	Toogood, H., 15 Hutchison Avenue, Ottawa	West Marsh Drainage Scheme, R. R. 1, Leamington, per Gerald Terron
Township of Nipissing, Nipissing, per Earl J. Gerber, Clerk	Toronto Soaring Club Inc., P. O. Box 856, Station "F", Toronto, per A. Firth, Secretary	Winkler, S., 6 Ridgevale Drive, Toronto
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PETITION

Vallance, Mrs. L. R., 338 Ash Street, Whitby, on behalf of:

H. Wydeven, 303 Chestnut St. E., Whitby
Mrs. A. Hill, 208 Chestnut St. E., Whitby
Dawson, 314 Chestnut St. E., Whitby
Mrs. Hoare, 510 Ash St., Whitby
Mrs. J. Heerschop, 512 Ash St., Whitby
U. VanderEnde, 514 Ash St., Whitby
Mrs. J. Kortekaas, 518 Ash St., Whitby
Mrs. W. Vesters, 513 Ash St., Whitby
Mrs. R. Vanslageren, 509 Ash St., Whitby

B. Wezely, 507 Ash St., Whitby
Mrs. J. Schipper, 206 Chestnut St. E., Whitby
L. Czer, 322 Ash St., Whitby
Mrs. Catharine Holmes, 320 Ash St., Whitby
Mrs. P. Jacobs, 302 Ash St., Whitby
Klaas Vlieger, 206 John St. E., Whitby
R. Morrison, 205 Chestnut St. E., Whitby
Mrs. Betty Anne Jeffries, 334 Ash St., Whitby
J. Beve, 310 Chestnut St. E., Whitby

APPENDIX III. ONTARIO AND FEDERAL LEGISLATION WHICH MAY AFFECT DRAINAGE AND THE OPERATION OF THE DRAINAGE ACT

Ontario Legislation

1. The Archaeological and Historic Sites Protection Act R.S.O. 1970, Ch. 26.
—section 3
2. The Assessment Act, R.S.O. 1970, Ch. 32.
—section 55
3. The Beach Protection Act, R.S.O. 1970, Ch. 40.
—section 7
4. The Cemeteries Act, R.S.O. 1970, Ch. 57
—section 45, 46, 58
5. The Conservation Authorities Act, R.S.O. 1970, Ch. 78
(as amended)
—section 20, 23, 27
6. The Ministry of Agriculture and Food Act, R.S.O. 1970, Ch. 109
(as amended)
7. The Environmental Protection Act, S.O. 1971, Ch. 86
(as amended)
—sections 1, 14
8. The Public Transportation and Highway Improvement Act, R.S.O. 1970, Ch. 201
—sections 23, 94
9. The Local Improvement Act, R.S.O. 1970, Ch. 255
—section 2
10. The Mining Act, R.S.O. 1970, Ch. 274
—sections 283, 284
11. The Municipal Act, R.S.O. 1970, Ch. 284 (as amended)
—sections 23, 293, 352, 354, 363, 383, 460
12. The Ontario Municipal Board Act, R.S.O. 1970, Ch. 323
—section 64
13. The Ontario Municipal Improvement Corporation Act, R.S.O. 1970, Ch. 32
—section 3
14. The Ontario Water Resources Act, R.S.O. 1970, Ch. 332,
(as amended)
—section 17
15. The Public Health Act, R.S.O. 1970, Ch. 377
—section 86
16. The Public Parks Act, R.S.O. 1970, Ch. 384
—section 19
17. The Tile Drainage Act, S.O. 1971, Ch. 37
18. The Agricultural Tile Drainage Installation Act, S.O. 1972, Ch. 38
19. The Settled Estates Act, R.S.O. 1970, Ch. 431
—section 16
20. The Railway Act, R.S.O. 1950, Ch. 331, (not consolidated in R.S.O. 1970)
—sections 53, 109, 110

Federal Legislation

1. Expropriation Act, R.S.C. 1970 (1st supplement) Ch. 16
—sections 37, 38

2. Farm Credit Act, R.S.C. 1970, Ch. F-2
—section 6
3. Farm Improvement Loans Act, R.S.C. 1970, Ch. F-3
—sections 6, 21
4. Government Railways Act, R.S.C. 1970, Ch. G-11
—section 2
5. National Energy Board Act, R.S.C. 1970, Ch. N-6,
(as amended)
—sections 37, 76, 77
6. Indian Act, R.S.C. 1970, Ch. 1-6
—section 81
7. Railway Act, R.S.C. 1970, Ch. R-2
—sections 208, 209, 210

APPENDIX IV. CASES IN DRAINAGE LAW

Although the Referee's written judgments are required to be filed with the administering department of the provincial government, it was not possible to obtain copies of all the judgments made in recent years. However, as many as possible were obtained from various sources and summarized for study and discussion by the Committee. The more important of these judgments are further summarized in this appendix and are for ready reference by interested municipal councillors, clerks, lawyers, and practising drainage engineers. The full written decisions of these cases are available in the office of the Drainage Co-ordinator in the Ontario Ministry of Agriculture and Food.

From 1952 until 1965, the decisions in these cases are by the Ontario Municipal Board acting as Drainage Referee. After 1965, decisions are by His Honour Judge S. L. Clunis acting as Drainage Referee.

Decisions of the Ontario Municipal Board as Drainage Referee, 1952-1965

1. Wright, et al. vs. the Corporation of the Township of Colchester North (December 1952)

In this case, the appellants complained that the engineer was interfering with natural surface drainage by providing in his report that the dirt should be cast to the east of the drain rather than to the west.

The Board dismissed the appeal saying "we feel that the discretion of the engineer should not be interfered with where there is no evidence of serious mistakes in a legal or engineering way."

2. M. Steiger, et al. vs. the Corporation of the Township of Middleton (March 1954)

The plaintiffs applied for an order to quash a by-law of the defendant municipality. Because of an emergency, petitioners were asked to waive their right of appeal and all but two petitioners did so. Council then proceeded with the work, which was completed in 1946. However, the by-law was not passed until October 1951 and not finally adopted until November 1951. Since the legislation at the time clearly required a by-law authorizing construction of the work to be passed before the work was begun, the Board held that the by-law was bad and must be quashed.

3. The Corporation of the Township of Elma, et al. vs. the Corporation of the Township of Grey (April 1954)

The plaintiff townships appealed on the basis that the benefits to be derived from the work were not commensurate with the costs and that the principles of assessment employed by the engineer were not correct.

The Board agreed that the cost was not commensurate with the benefits to be derived and did so solely on the evidence of three engineers who appeared before them.

The Board was critical of the engineer's assessment methods and held that the engineer's report was invalid since his method of assessment was incorrect. The Board criticized the Township of Grey for not examining the economics of the proposal more closely before embarking on the project.

4 Benjamin J. Warren, et al. vs. the Corporation of the Township of Enniskillen (October 7, 1955)

The council of the Township of Enniskillen referred back a report to the engineer. "with instructions that the entire drain be made an open drain." In considering this case, the Municipal Board stated that "it seems to be quite clearly established that an engineer acting under the provisions of The Municipal Drainage Act must exercise his independent judgment and to some extent at least act judicially." The council quite properly referred back the engineer's report for reconsideration under Section 19, but nothing in this section gives the council authority to give any instructions as to the manner in which his report should be made. The Board concluded that there was no doubt that the council's resolution did instruct the engineer that the drain be made an open drain. The Board felt that the engineer's judgment had been affected by the instructions given him. For this reason, the Board was of the opinion that a report made under such circumstances cannot be allowed to stand. It overturned the report as not being in compliance with the provisions of the Act.

5. Mitchell vs. the Corporation of the Village of Oil Springs (January 1956)

This was an application for an order for man-

damus to compel the repair of a drain. The municipality argued that there was in fact no municipal drain in existence because it had been destroyed by the action of the Department of Highways, which had relocated the original drain some years previous. The Board held that one part of the drain, the tile, was still in existence even though evidence was presented that it had been rendered ineffective. The Board also held that even though the new drain had been constructed by the Department of Highways, it was still a municipal drain under The Drainage Act and still the responsibility of the village. The Board held that the relocation of the drain, even though done by the Department of Highways, was done with the full knowledge of the village authorities and that they were aware that it was merely a relocation. Accordingly, the Board ruled that the village did have responsibility and an order for mandamus was granted.

6. Bruce Ingrams and H. W. Evers vs. the Corporation of the Township of London (February 24, 1956)

This was an application to quash a by-law of the Corporation of the Township of London. This by-law authorized the construction of a drain that would carry off to the north water which found its way into the Huron Street drain. The plaintiffs argued that the petition which gave rise to the by-law merely requested a change in the existing works, and therefore could not really be said to be a petition within the meaning of the petition section of The Drainage Act to allow the authorization of the construction of a new drain. The Board held that, from the evidence, the council was without jurisdiction to undertake the work proposed in the by-law and therefore the application was granted and the by-law was quashed.

7. Re: The Corporation of the Township of Windham (November 22, 1956)

The drain involved in this case was constructed by the Township of Burford and part of it was on the town line between Burford and Windham. No assessment, however, was made against any lands located in Windham. Over the years, the drain widened by natural erosion and endangered the railway and the adjoining fences. Windham was interested in correcting this condition and in erecting access bridges and was seeking a change in the original assessment. Windham applied to the Referee under what is now Section 51 of the Act asking for permission to secure the report of an engineer.

The Board held that since Windham was not involved in the work in the first instance and was therefore not liable for any contribution, it had no status before the court under Section 51. The application was dismissed.

8. James Buchan vs. the Corporation of the Township of Orford (April 1957)

This was an application for an order for mandamus to compel Orford to take water from a drain to a sufficient outlet or to pay damages for future injury as well as damages for injury already sustained. The plaintiff argued that his damages were caused by additional water being made to flow through the water course as a result of work done by the municipality to the drain further upstream. The Board dismissed the case on the evidence that the amount of erosion was not extensive and did not show that any appreciable damage had been caused resulting from increased water or increased rate of flow.

9. Storm vs. the Corporation of the Township of Humberstone (June 1957)

As a result of an earlier action claiming damages for improper drainage and requesting an order for mandamus requiring the township to repair and improve certain drains, the township instructed an engineer to prepare a report and authorized the expenditure of \$11,000 to cover the costs of damages, the hearing, and the necessary repair work. The plaintiff stated that the water levels on his land were still above the outlet of the tile drains after the work was done and that he was forced to discontinue his market garden and switch to other crops, thus losing money in the process. The municipality contended that it had done the work required and had maintained the drains in accordance with advice ever since. Nevertheless, the municipality did obtain a report from an engineer who advised that it would be uneconomical to attempt to maintain the drains in accordance with the 1947 report but rather that new improvements were necessary, which also would be uneconomical.

The Board upheld the township saying it had acted in good faith, particularly in view of the engineer's opinion that the cost of further repairs would be prohibitive. The Board did not feel that the township should be ordered to make additional large expenditures which could not be justified.

10. Haigemeyer vs. the Corporation of the Township of MacGillivray, et al. (November 1957)

The plaintiff asked for an order compelling the defendant townships to provide sufficient outlet for waters flowing into certain drains and for damages suffered by him as a result of flooding. The Board ruled that there is no obligation on the defendant municipalities to provide an outlet for the water flowing naturally on the plaintiff's land in addition to the waters flowing artificially from the drain. All that is required is that the municipality provide sufficient capacity to contain the artificial waters brought down

together with the natural waters it had always heretofore carried, thereby leaving the land in no worse condition than before the artificial work was done.

The plaintiff also claimed damages resulting from nonrepair. The municipality admitted that the drain was out of repair but argued that the plaintiff's damages were not related to this state of disrepair. The Board ruled that the municipality had discharged its responsibility in this case.

11. Lloyd House vs. the Township of Middleton (in the Ontario Court of Appeal, December 1958)

In 1945, the municipality spent more than \$11,000 on widening and deepening certain ditches. Because none of the provisions of The Municipal Drainage Act were complied with, it was concluded that this was not a drain under that Act.

In 1951, council passed a by-law to provide for payment for the cost of construction of the work done in 1945. In 1954, the Drainage Referee had made an order quashing this by-law. (See Steiger, et al vs. The Township of Middleton, supra.)

After the quashing order, the appellant, together with others, filed a petition in 1956 under The Municipal Drainage Act asking for further work and improving the system of drains. The engineer appointed as a result of this petition granted the municipality an allowance of \$4,000 for the work done in 1945.

The appellant appealed the engineer's report to the Referee either to quash the by-law or to delete the allowance of \$4,000 to the municipality. Acting as Referee, the Municipal Board refused the application and refused to amend the engineer's report. As a result, the case was appealed to the Ontario Court of Appeal.

The court held that, with the by-law passed by the municipality in 1951 having been quashed, the municipality could not in 1956 attempt to hold the land-owners liable or compel payment by them for work done by the municipality in 1945.

Decisions of the Drainage Referee, His Honour Judge Sidney L. Clunis, 1965-1972

1. The Corporation of the Township of Mosa vs. the Corporation of the Township of Ekfrid (March 1965)

This case settled the question of what is to be done with the engineer's report that is resubmitted after having been referred back to him for reconsideration. The Referee held that, under Section 28 of The

Municipal Drainage Act, a report coming from an engineer for a second time must comply with all the provisions of Section 24 as though it were the original engineer's report. Because the council of the Township of Ekfrid had not demonstrated its intention to proceed under Section 24, there is no appeal under Section 38.

2. The City of Niagara Falls vs. the Township of Niagara (June 1966)

The City of Niagara Falls moved to quash a provisional by-law passed by the Township of Niagara. The Referee concluded that there is no jurisdiction in the Referee under The Drainage Act to quash a provisional by-law but only a final by-law. He found that only after disposition of all appeals can a final by-law be passed. He concluded that if the right to move to quash could be exercised at any time after the passing of the provisional by-law, there would be needless litigation fostered in respect of the proposed scheme.

3. Bodnarchuk vs. the Municipality of the Township of West Gwillimbury (May 1966)

The engineer in this case reported that the drain was in need of repair at an estimated cost of \$10,000. He also estimated that \$1,000 worth of damage would be done as a result of spoil disposal. He also reported that the cost was to be assessed in the same manner as the cost of original construction.

In adopting the report, the council passed the necessary by-law but did not serve notice on the people assessed and did not hold a court of revision. The plaintiff contended that these omissions rendered the by-law invalid. The Referee made a distinction between original construction, repair, and a work of improvement. The Referee held that the work was one of repair and that since no variation of the original construction assessment was proposed, there was no obligation on the municipality to notify the ratepayers or establish a court of revision. Therefore, the by-law was held to be valid.

4. Lawrence McKeen vs. the Corporation of the Township of East Williams and the Corporation of the Township of Adelaide (May 1966)

The application was to set aside or modify the engineer's report and to quash the by-law which adopted the report. The engineer's report recommended the construction of a drain of larger proportions than the drain petitioned for. Referee Clunis held that the original petition was invalid since it did not describe a real drainage area and concluded that the resulting by-law must be set aside.

5. *Suhr vs. the Corporation of the Township of Dover and the Corporation of the Township of Chatham (May 1967)*

The plaintiff had built a boat well and a boat house in the channel of the Skinner outlet drain. He was seeking a declaration that these were not obstructions within the meaning of The Drainage Act on the grounds that the obstruction created by the boat house was not nearly as great as obstructions existing elsewhere in the drain. This argument was rejected because, if accepted, it would authorize anybody to obstruct a drain when the drain is out of repair. The Referee declined to declare the buildings were not obstructions.

6. *Chesapeake and Ohio Railway Company vs. the Corporation of the Township of Sombra (December 1967)*

The railway company was appealing to the Referee from the engineer's report for the repair and improvement of a drain. The report recommended relocation of the drain to such a position that a culvert would need to be placed beneath one of the railway lines. The report recommended assessing the cost of the culvert against the railway.

The right of the railway to appeal is restricted to three items under The Drainage Act: (1) that the report does not comply with the Act, (2) that the benefits are not commensurate with the costs, or (3) that the drainage works should be modified on grounds to be stated. The Referee dismissed the appeal, since in his opinion the engineering evidence did not justify modifying the works as set out in the engineer's report. Engineers for both the railway and the municipality had already agreed to the need of the proposed work and the Referee consequently was unwilling to alter the report.

7. *William A. Anderson, et al. vs. the Corporation of the Township of Thurlow (November 1968)*

This was an appeal from an engineer's report. The engineer had been appointed to make a report on the need for repair of a drain. Before acting on this report, however, the council received a petition requesting construction of a new drain having an outlet in the drain which was proposed to be repaired. Council referred the original report back to the engineer and requested him to make a new report including the petition for the new drain.

The plaintiff claimed that the report was invalid since the engineer had failed to set out the approximate number of acres of land affected. This was dismissed by the Referee since the number of acres had indeed been set out in the report.

Another complaint was that the engineer had not used a proper method for determining liabilities and benefits. The engineer had divided the entire drainage scheme into three parts when he consolidated his two reports. In so doing, however, he ignored the distinctions and assessed all the land fronting either the branch or the main drain at \$6 per acre for benefit. The Referee found that this method of assessing benefit was completely unsatisfactory. The Referee pointed out that the engineer is bound to apportion the cost of the work among the different parcels of land receiving benefit strictly according to the benefit derived. The Referee noted that the engineer's report failed to take into account the varying benefits which would accrue as a result of the elevation of the land, the distance of the land from the outlet, and other matters that might properly be considered. He therefore concluded that the report did not comply with the requirements of the Act and should be set aside.

8. *Dodds vs. the Corporation of the Township of McNab (December 1969)*

An open ditch constructed by the municipality conducted water from a neighbouring farm to the plaintiff's land, causing a pond of water to accumulate and making the land useless for the purpose of constructing a service station. The Referee held the Municipality liable in trespass. The municipality's defence that the ditch was constructed pursuant to the provisions of The Drainage Act was not substantiated, since the Referee had no evidence of a by-law or court of revision or the other necessary procedures under The Drainage Act.

9. *Gerald Eek vs. the Corporation of the Township of King (February 1970)*

The plaintiff in this case claimed that the municipality had failed to maintain and repair a drain under Section 53 of The Drainage Act, 1962-63. Because of the lack of maintenance, the efficiency of the drain was hampered and the plaintiff's crops suffered. The plaintiff had not given notice of nonrepair to the township under Section 54 of the Act until some 15 months after the damage had occurred. The Referee held that failure to give such notice constituted a bar to the action and the action was dismissed.

10. *Murray Gardner vs. the Corporation of the Township of Zone (February 1971)*

As a result of a notice of nonrepair, the Township of Zone appointed an engineer to report. At one point, the report required the installation of a 30-inch culvert. Instead of installing a 30-inch culvert, the contractors installed a 15-inch pipe and in so doing gave evidence that the plaintiff had consented to this change. This was denied by the plaintiff.

Referee Clunis noted that, regardless of the plaintiff's consent if it were given, there was no right in law to change the engineer's report and by changing the engineer's report the township had caused flooding on parts of the plaintiff's land. The Referee went on to say that the township had no right whatsoever to alter the engineer's report and no right after the adoption of the report to construct a drain which differed from that described in the report. The Referee ruled against the township and awarded damages of \$3,600 and costs in favor of the plaintiff.

11. Godo vs. the Corporation of the City of Windsor (April 1971)

In 1969, the City of Windsor had obtained special legislation giving them the right to substitute either area or general rate assessment for the method provided by The Drainage Act. The City of Windsor authorized a firm of engineers to be engaged and after receiving their report passed a provisional by-law authorizing the work.

The appellant in this action claimed that the engineering firm appointed was not an engineer in accordance with Section 1 of The Drainage Act, which defines an engineer as one who is registered as a professional engineer under The Professional Engineers Act, etc. The city countered with the argument that The Professional Engineers Act authorized a corporation holding a certificate of authorization in its own name to practise professional engineering and that this practise included the words "drainage works."

The Referee concluded that it did not fall within the definition of "engineer" under The Drainage Act and that the report therefore did not comply with the provisions of the Act.

The engineer's report was also ruled invalid on the ground that the provisional by-law passed by the City of Windsor was not a by-law contemplated by the City of Windsor special legislation but rather a provisional by-law within the meaning of The Drainage Act. Accordingly, the Referee held that the city was required to make an assessment in accordance with The Drainage Act, since it had failed to act in accordance with the procedure specified by the City of Windsor Act.

12. The Corporation of the Township of Wallaceburg vs. the Corporation of the Township of Chatham (June 1971)

A petition was received by the Township of Chatham and an engineer was appointed who reported that the land in question was being flooded. His recommendations were aimed at alleviating the flooding. A large portion of the cost of implementing

the recommendations was assessed against the roads and thus against the plaintiff township.

The plaintiff township appealed on the grounds that the assessment was excessive. Referee Clunis noted that the assessment on the road was ten times the farm land assessment and in his opinion was excessive. He could reach two conclusions: (1) to set aside the engineer's report or (2) direct an amendment to the proposed assessment. He chose the latter alternative and reduced the assessment against the Township of Wallaceburg by \$500.

13. Baker vs. the Corporation of the Township of Artemesia (June 1971)

The township received the engineer's report and sent a notice to the plaintiff of the reading of the report as required by The Drainage Act. The notice, however, did not mention the amount or kind of assessment levied against the plaintiff's land. Accordingly, Referee Clunis held that the by-law passed later was invalid. In making his judgment, the Referee said that the statutory provisions must be strictly complied with wherever a municipality seeks to make an assessment.

14. Gurdziel vs. the Corporation of the Township of Burford (January 1972)

Believing that a municipal drain on his property created a hazard, the plaintiff filled in the ditch and replaced it with a 12-inch tile drain. Council notified the plaintiff to remove these obstructions and the plaintiff applied for an injunction to prevent the municipality from taking any action.

The Referee held that the evidence established beyond question that the plaintiff had decided to change the construction of the drain to suit his own convenience and in so doing did not follow the provisions of the Act. The action for an injunction was dismissed.

15. John J. Wilson vs. the Corporation of the Township of Harwich (August 1972)

The plaintiff appealed the engineer's report on the grounds that the work had been carried out carelessly and that there was another location for the drain which would be more efficient and cost less than that proposed by the engineer.

The evidence presented to the Referee supported the plaintiff's claims, but the defendant township argued that the plaintiff was not the registered owner of the land and merely the assessed owner. The Drainage Referee did not agree with this argument. He ruled that the plaintiff had the right of appeal as the assessed owner of land. The appeal succeeded and the report was set aside.

16. *The Corporation of the Township of Woodhouse vs. Decoutere Farms Ltd. and Daniel Decoutere (November 1972)*

The plaintiff township was seeking an order to restrain the defendants from interfering with the contractors of the township to construct a drain under The Drainage Act. The Referee concluded that the defendants had no right and no reason to interfere with the plaintiff's servants or agents in the discharge of their duty. He issued an order restraining the defendants from interfering with the plaintiff or the plaintiff's agents or servants or anyone lawfully employed by the plaintiff to construct or repair or maintain a tile drain within the defendant's land.

17. *The Corporation of the Township of Woodhouse vs. Joseph Tchorek and Irene Tchorek (November 1972)*

This action is similar to the one previously cited where the township was seeking an order to restrain the defendant from interfering with the construction of the drain. The defendant had refused to allow the municipal engineer and certain contractors to enter his land. He claimed that his land would be adversely affected if the drain was built and furthermore that the need for the drain could be removed by making certain alterations in a nearby road.

The Drainage Referee felt that these submissions had some weight but that the defendant was not applying to have the report set aside as he had a right to do. Since these were the only reasons offered to justify the defendant's actions, the Referee concluded that the corporation had established its right to relief. Therefore an injunction was awarded to the plaintiff restraining the defendant from interfering with the construction of the drain.

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